PROJECT MANUAL

ICE ARENA – PORTABLE ICE REFRIGERATION SYSTEM

UIUC BUILDING # 14

505 E. Armory
Champaign, IL 61820

UIUC Project #U15086
Legat Project #215067.00

Contracts:  
Division 01  General Work
Division 03  Heating, Piping, A/C, Controls Work
Division 05  Electrical, Fire Alarm and Audio Visual Work

Using Agency:  University of Illinois at Urbana-Champaign
Release:  BIDDING

Legat Architects
2015 Spring Road – Suite 175
Oak Brook, Illinois  60523
630.990.3535

UIUC  Ice Arena Portable Ice System
UIUC PROJ.: U15086

Signature  ____________________________  
Date Signed  ____________________________  

License Expiration Date  Nov. 30, 2016

BIDDING
November 17, 2015
# BIDDING REQUIREMENTS

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NOTICE TO BIDDERS

The Board of Trustees of the University of Illinois, hereinafter referred to as the "Owner," furnishes the following information and special instruction to prospective bidders desiring to submit bids for the work on the following project:

1.0 PROJECT INFORMATION

1.1 Project Name. Ice Arena - Portable Ice Refrigeration System
1.2 Project Number. U15086
1.3 Project Description.

Replacement of the existing ice refrigeration system with a new portable system. Work shall include demolition of the existing dasher boards, glass and all related support structure; cutting and removal of the existing ice slab to accommodate the new headers and piping required for the portable ice system; installation of a new reduced size rink (+/- 192' x 100') including new dasher boards, glass and related components; installation of a rooftop chiller, pumps and modification of the structure above room 130 for support of the new system; replacement/ modification of the flooring and platforms around the rink as required for accessibility and to infill the platform area related to relocation of the west dasher boards; and evacuation/ remediation of the existing refrigerant, calcium chloride and asbestos pipe wrap in the tunnels at locations of piping modification. Also all other work as indicated in the contract documents.

Refer to Division 01 of the technical specifications for a complete, detailed breakdown of the base bids and alternates for this project.

This project includes a Project Labor Agreement that will be executed between the lowest responsible/responsive bidder and the East Central Illinois Building and Construction Trades Council. A copy of the Project Labor Agreement is included at the end of Section 00 90 00.

1.4 Project Location.

UIUC Ice Arena 406 E. Armory, Champaign, Illinois  61820

1.5 Contract Documents Prepared By:

Legat Architects, Inc.
651 W. Washington Blvd., Suite 1
Chicago, IL  60661

hereinafter referred to as the Professional Services Consultant.

2.0 SPECIAL INSTRUCTIONS TO BIDDERS

The following bidding instructions are a component part of each bid wherein they are applicable.

2.1 Submission and Receipt of Bids.

2.1.A Contract Divisions of the Project. The Owner will receive separate sealed bids for the following contract divisions of the project:

01 - General Work
02 - Plumbing Work
2.1.B **Assignments.** The Owner shall assign the contracts for Contract Divisions

02 - Plumbing Work  
03 - Heating A/C Temp Control Work  
05 - Electrical Work  

to the Contract Division 01 - General Work (Contractor) in accordance with paragraph 6.3 of the General Conditions. (Refer to paragraph 6.3 of the General Conditions and Article 5 of the Agreement for requirements concerning assignment of contracts.)

2.1.C **Delivery.** Submit bids on forms furnished by the Owner.

Deliver all bids to:

Facilities and Services  
1501 South Oak Street, Room 115  
Champaign, IL 61820  

2.1.C.1 Bids will be received up to the hour of 2:00 PM prevailing time, on 12/18/15 for Contract Divisions  
02 - Plumbing Work  
03 - Heating A/C Temp Control Work  
05 - Electrical Work  

2.1.C.2 Bids will be received up to the hour of 2:30 PM, prevailing time, on 12/22/15, for Contract Division  
01 - General Work.

2.1.D **Bid Opening.** Immediately after the closing time for receiving bids, they will be opened, publicly read, and tabulated for Contract Divisions 02 - Plumbing Work, 03 - Heating A/C Temp Control Work, 05 - Electrical Work in Physical Plant Services Building, 1501 South Oak Street, Room 128 Champaign, IL 61820 and for Contract Division 01 - General Work in Physical Plant Services Building, 1501 South Oak Street, Room 128 Champaign, IL 61820.

2.2 **Bid Documents.**

2.2.A **Bid Documents.** The bid documents include, but are not limited to, the Notice to Bidders, bid forms, the project manual (including supplementary conditions, list of drawings, schedules and tables, details, and specifications), drawings, and addenda.

2.2.B **Procurement.** Up to two (2) set(s) of Bid documents per prequalified bidder of the divisions of work being bid may be obtained from the Professional Services Consultant by depositing a check made payable to the Professional Services Consultant in the amount of $150 OR non-cash plan deposit programs which are guaranteed by contractor associations are acceptable.

2.2.C **Return.** If applicable, the above deposit will be refunded upon the return of the bid documents in good condition within ten (10) days after bid opening date. The bid documents shall remain the property of the Owner. They shall not be returned with the bids, but shall be returned under separate cover to the Professional Services Consultant’s office.
2.2.D **Reference Sets.** For the convenience of bidders, the project manual, drawings, and all addenda will be available for electronic viewing at no cost to potential bidders. Complete sets of printed documents will also be on file for reference at:

Legat Architects, 2015 Spring Road - Suite 175M Oak Brook, Illinois 60523
(630)990-3535 and Dean's Superior Blueprint, 404 E. University Champaign, Illinois 61820 (217) 359-3261, URL: http://www.uiucplanroom.com/

2.3 **Examining the Site.** Arrangements to visit and examine the site in accordance with Document 00 20 00-General Instructions to Bidders may be made by contacting Bill Zeman, phone 217-244-3586.

2.4 **Annual Prequalification.** Each bidder is required to be prequalified on an annual basis with the Owner in accordance with Document 00 20 00-General Instructions to Bidders.

2.5 **Prebid Conference.** A MANDATORY prebid conference for all parties interested in bidding the project will be held in UIUC Armory 505 E. Armory, Champaign, Illinois 61820 at 10:00 AM on 12/01/15.

Representatives of the Owner and the Professional Services Consultant will be present to answer questions regarding the project and bidding procedures. All prospective bidders are REQUIRED to attend.

2.6 **IDOL Schedule of Current Prevailing Wage Rates.** Pursuant to the Prevailing Wage Act, the most current schedule of prevailing wage rates for all crafts (which includes the hourly basic wages, the hourly overtime rates, and the hourly fringe rates for health and welfare, insurance, vacation, and pension benefits) published by the Illinois Department of Labor for the locality in which the work is to be performed, that was available to the Owner at the time the documents were issued for bidding, is attached at the end of Document 00 90 00 and incorporated herein. If the Illinois Department of Labor revises the prevailing rate of hourly wages to be paid by the Owner, the revised rate shall apply to this contract. The prevailing rate of hourly wages is revised by the Illinois Department of Labor and is available on the Illinois Department of Labor's official website.

2.7 **Builder's Risk Insurance.** Builder’s Risk Insurance, pursuant to General Conditions Article 19, shall be provided by 01 - General Work for the entire Project as determined by the Owner. Owner-purchased building materials and supplies, equipment, machinery and fixtures intended to become a permanent part of the project valued at $0.00 shall be included in this Builders Risk Insurance coverage.

2.8 **Vendor Registration.** The awarded low, responsive and responsible Bidder will be required to register with the Owner’s Vendor Services Application, and will be required to ensure that all Bidders’ subcontractors, vendors, and suppliers to be included on its Schedule of Values as identified in document 00 70 00 ‘General Conditions’ are also registered in the Owner’s Vendor Services Application. The vendor registration module of the Vendor Services Application can be accessed at:

https://appserv6.admin.uillinois.edu/VendorRegistration/open/VendorSearch.jsp

2.9 **Business Enterprise for Minorities, Females, and Persons with Disabilities Act.**

2.9.A This project has goals for participation by minority and female owned businesses as bidders, subcontractors or suppliers in accordance with the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. Only MBE/FBE/FMB firms certified with the Illinois Department of Central Management Services (CMS) are acceptable. Printed proof of current and valid CMS MBE/FBE/FMB certification must be provided with the bid for each identified MBE/FBE vendor. A print version of the vendor’s CMS Business Enterprise Program (BEP) Vendor Directory results should be the printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, certification, renewal date and
expiration date. If a current and valid CMS BEP certification letter is included with the bid, reconciliation to obtain proper printed proof is allowed. If the CMS BEP certification letter is not current and valid, reconciliation is not permitted.

The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

https://www.uocpres.uillinois.edu/UserFiles/Servers/Server_7758/file/training/wbt/WBTMAFBESearch.swf

NOTE: MBE/FBE goals are separate and distinct from workforce projections (Attachment A of Document 00 40 00).

Each Bidder shall name the MBE/FBE owned firm(s) it intends to use to meet the specified goals set for this project on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form document 00 40 00. The MBE/FBE goals for this project are as follows (“N/A” in “Combined Goal” column means split goals are in effect and “N/A” in “Split Goals” column means combined goals are in effect for each specific division of work):

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<tr>
<td>05 - Electrical Work</td>
<td>15</td>
<td>N/A</td>
</tr>
</tbody>
</table>

If the MBE/FBE goals are not met, the Bidder shall submit within ten (10) calendar days after the bid opening documentation of its good faith efforts to achieve the MBE/FBE goals (See General Instructions to Bidders, Document 00 20 00). Failure to submit such documentation, or to use good faith efforts, shall result in rejection of the bid.

2.9.B **Goal Credit.** Only those vendors who are certified by the Illinois Department of Central Management Services as of the date of the bid opening will be considered in determining whether the vendor meets the participation goal.

2.9.C **MBE/FBE Participation Cure Period.** If the Bidders fail to meet the MBE/FBE participation goal at the time of bid submittal, they are granted a cure period of ten (10) calendar days to meet the goal. The cure period shall run concurrently with the Good Faith Effort Period.

2.9.D Bidders may request assistance in locating MBE/FBE businesses from the Director of Diversity, University Office of Capital Programs and Real Estate Services. (http://www.uocpres.uillinois.edu/about/contact)

2.9.E Once the contract is awarded, the awarded contractor is required to submit, in accordance with General Instructions document 00 20 00 a completed Attachment A - MBE/FBE Subcontractor/Supplier Certification Form of the Notice of Intent to Award or Notice of Award letter for each of the MBE/FBE subcontractors/suppliers utilized to meet the goals.

2.9.F The MBE/FBE business named and the subcontract dollar amount on the two forms (Attachment B - Minority/Female Business Enterprise Program Requirements of bid form document 00 40 00 and Attachment A - MBE/FBE Subcontractor/Supplier Certification Form of the Notice of Intent to Award or Notice of Award letter) must match.
GENERAL INSTRUCTIONS TO BIDDERS

The following bidding instructions are a component part of each bid wherein they are applicable:

1.0 EXAMINATION OF THE BIDDING INSTRUCTIONS AND CONTRACT DOCUMENTS

The Bidder shall read and thoroughly examine and will be held to have thoroughly read and examined all of the bidding instructions and the Contract Documents (defined in Article 2 of the General Conditions), including but not limited to the drawings, the General Conditions, and all of the specifications which may in any manner affect the Work under this contract prior to submitting a bid. Failure of the Bidder to become fully acquainted with the bidding instructions and Contract Documents or the amount of Work involved in this contract will not be considered subsequently as a basis for additional compensation.

2.0 EXAMINATION OF THE SITE

2.1 Site Visit. The Bidder, before submitting a bid for this Work, shall visit and carefully examine the site of the Work in order to have full knowledge of, and to fully understand and appreciate, the facilities, difficulties, and restrictions attending the performance of the contract for which a bid is submitted. The Bidder shall take all required measurements and carefully inspect all existing conditions, constructions, irregularities, and interferences which may affect the Work under this contract.

2.2 Adjoining Work. Where the Work includes alterations or new Work connecting with existing construction, the Bidder shall determine all alterations and patching which will be required in existing construction to permit the completion of all new Work indicated in general detail to accomplish the ultimate results required by the Contract Documents.

2.3 Conditions Affecting the Cost of the Work. No additional compensation will subsequently be allowed for site conditions affecting the Bidder's cost which could have been discovered, known to, or appreciated by the Bidder during the site examination required prior to the submission of a bid, unless such conditions are determined by the Professional Services Consultant to have been unforeseeable or undiscoverable by the Bidder pursuant to paragraph 14.4 (titled “Claims for Concealed or Unknown Conditions”) of the General Conditions.

3.0 INTERPRETATION OF THE CONTRACT DOCUMENTS

3.1 Discrepancies and Omissions. In the event that any discrepancies or omissions (either within the bidding and Contract Documents or between the documents and the conditions of the site) are discovered before the bids are submitted, the Bidder shall immediately report them to the Professional Services Consultant for a decision, and the Professional Services Consultant will instruct all Bidders by an addendum to the Contract Documents.

3.2 Contract Document Interpretation. Interpretation of the Contract Documents, prior to the bid opening date, will be made only by addenda duly issued by the Professional Services Consultant. Any explanations or interpretations not so made will not be binding upon the Professional Services Consultant or the Owner. The Bidder shall acknowledge the receipt of addenda in the bid.

4.0 BIDDER’S QUALIFICATIONS

4.1 Statutory Requirements. In order to sell to or contract with The Board of Trustees of the University of Illinois, the Bidder must comply with the requirements of the Illinois
4.2 Annual Prequalification. The Bidder shall prequalify in accordance with the instructions contained herein. All Bidders shall be prequalified with the Owner. New Bidders that are not prequalified shall prequalify with the Owner using the Owner’s web-based Contractor Annual Prequalification System (CAPS). The Bidder shall follow the instructions contained in the CAPS and submit to the Owner 14 days before bidding a University of Illinois project. The application may take 14 days to process after a complete and accurate application is received by the University of Illinois Campus Construction Unit. The following information is required in the Annual Prequalification Statement:

4.2.A Federal Taxpayer Identification Number (Section 1). Enter the Bidder's Federal Taxpayer Identification Number (FTIN). Individuals and sole proprietors should enter their Social Security Number (SSN). All other business entities should enter their Federal Employer Identification Number (FEIN).


4.2.C Illinois Central Management Services Certified Business Enterprise (Section 3). Identify if the Bidder is a Minority, Female, or Persons with Disabilities Business Enterprise as defined in Section 2 of the Illinois Business Enterprise for Minorities, Females, and Persons with Disabilities Act, as amended (30 ILCS 575/0.01 et. seq.). If so, provide additional information relating to minority or female, the applicable minority category, and the Bidder's certification status with the Illinois Department of Central Management Services (CMS). Additionally, identify if Bidder is a Veteran Owned Small Business or a Service Disabled Veteran Owned Small Business, as defined in the Illinois Procurement Code as amended (30 ILCS 500/45-57).

The following definitions apply:

4.2.C.1 Minority means a person who is a citizen or lawful permanent resident of the United States who is:

4.2.C.1.1 Black/African American (a person having origins in any of the black racial groups in Africa);

4.2.C.1.2 Hispanic American (a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race);

4.2.C.1.3 Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands); or

4.2.C.1.4 Native American or Alaskan Native (a person having origins in any of the original peoples of North America).

4.2.C.2 Female means a person who is a citizen or lawful permanent resident of the United States who is of the female gender.

4.2.C.3 Minority-Owned Business (MBE) means a business concern which is at least 51 percent owned by one or more minority persons, or, in the case of a corporation, at least 51 percent of the stock is owned by one or more minority persons; and the management and daily
business operations of which are controlled by one or more of the minority individuals who own it.

4.2.C.4 **Female-Owned Business (FBE)** means a business concern which is at least 51 percent owned by one or more females, or, in the case of a corporation, at least 51 percent of the stock is owned by one or more females; and the management and daily business operations of which are controlled by one or more of the females who own it.

4.2.C.5 **Female Minority Owned Business (FMB)** means a business concern which is at least 51 percent owned by one or more female minorities, or, in the case of a corporation, at least 51 percent of the stock is owned by one or more female minority; and the management and daily business operations of which are controlled by one or more of the female minority who own it. All FMB firms are considered to be within either “MBE” or “FBE” categories. For purposes of University of Illinois Contract Documents, FMB firms will be included in “MBE/FBE” References.

4.2.C.6 **Person with Disability Owned Business (PBE)** means a business concern that is at least 51% owned by one or more persons with a disability and the management and daily business operations of which are controlled by one or more of the persons with disabilities who own it. A not-for-profit agency for persons with disabilities that is exempt from taxation under Section 501 of the Internal Revenue Code of 1986 is also considered a “business owned by a person with a disability”.

4.2.C.7 **Service-Disabled Veteran-Owned Small Business (SDVOSB)** means a small business (i) that is at least 51% owned by one or more qualified service-disabled veterans living in Illinois or, in the case of a corporation, at least 51% of the stock of which is owned by one or more qualified service-disabled veterans living in Illinois; (ii) that has its home office in Illinois; and (iii) for which items (i) and (ii) are factually verified annually by the Department of Central Management Services.

4.2.C.8 **Veteran Owned Small Business (VOSB)** means a small business (i) that is at least 51% owned by one or more qualified veterans living in Illinois or, in the case of a corporation, at least 51% of the stock of which is owned by one or more qualified veterans living in Illinois; (ii) that has its home office in Illinois; and (iii) for which items (i) and (ii) are factually verified annually by the Department of Central Management Services.

4.2.D **Business Organization (Section 4).** Provide information indicating whether the Bidder's business organization is a sole proprietorship, partnership, or corporation and provide the additional information requested for the applicable type of business organization. For corporations, the term "registered agent" refers to the contact person identified in the corporation's annual report filed with the Illinois Secretary of State.

4.2.E **Key Personnel, Business, and Financial Information (Sections 5).** Provide historical information, business volume, financial references, and the number of managerial and supervisory personnel employed by the Bidder.

4.2.F **Disclosures and General Questions (Section 6).** Answer all questions in this Section. The questions relate to the Bidder’s eligibility to enter into a contract with The Board of Trustees of the University of Illinois and to the statutory
requirements, which may affect the Bidder's ability to perform all contractual responsibilities.

4.2.G Performance Bond and Payment Bond (Section 7). Identify the Bidder's surety, its surety’s A.M. Best Co. Rating, and local agent. The Bidder's surety shall have a policyholder's rating not lower than "A-" and a financial rating not lower than "VI" in the current edition of Best’s Key Rating Guide for property/casualty insurance companies. The Bidder’s surety shall also be licensed to write surety bonds in the State of Illinois and shall be listed on the United States' Department of the Treasury’s Listing of Approved Sureties (Department Circular 570), and shall have an underwriting limitation in an amount not less than the amount bid by Bidder including all alternates, if any.

4.2.H Summary of Work Experience (Section 8). Provide a resume of the Bidder's experience in similar projects, including a list of the following:

4.2.H.1 Similar contracts completed within the last five years.

4.2.H.2 Contracts currently under construction.

4.2.H.3 Contracts upon which the Bidder is negotiating a contract or is the apparent low Bidder even though no contract has yet been awarded.

The Bidder shall list all public works contracts performed within the last two years or the four most recent public works contracts performed, whichever is fewer. The Bidder shall provide information in sufficient detail to enable the Owner to evaluate the Bidder’s capacity and experience to provide project coordination on University of Illinois projects (including assigned contracts) and to ensure the completion of projects within the time specified.

Note: The Owner reserves the right to require from the Bidder a detailed statement regarding the business and technical organization and the physical facilities and equipment of the Bidder that is available for the Work that is contemplated, information pertaining to financial resources and experience of personnel, and any additional information or documentation necessary to satisfy the Owner that the Bidder is equipped and prepared to finance and perform the Work.

4.3 Application for Renewal. A prequalification renewal will be sent to Bidders approximately 45 days before the expiration of current prequalification. Bidders who do not receive a prequalification renewal are responsible for obtaining one at least 30 days prior to expiration. When all information is complete and satisfactory, processing may take up to 14 days. When any information is incomplete or unsatisfactory, a longer processing time will be required. Bidders will be notified when information is incomplete or unsatisfactory. Unless otherwise specified in writing by the Owner, the term of prequalification is one year. When prequalification is granted, the bidder will be notified in writing of the expiration date. The Owner may grant a shorter term of prequalification when a determination is made by the Owner that a shorter period is justified. The Owner, in its discretion, may grant a longer period of prequalification when deemed appropriate.

4.4 Project-Specific Prequalification. The Project-Specific Prequalification Statement shall be submitted to the Owner as soon as possible but in any event not later than the date and time stipulated in the Notice to Bidders. The Project-Specific Prequalification Statement shall be submitted on the forms included with the bid documents and in an envelope marked "Project-Specific Prequalification." Failure to submit the required information by the project-specific prequalification deadline and failure to meet the project-specific prequalification requirements may result in the bid being returned unopened. Project-specific information required by the Owner shall be stated in Document 00 46 00 – Project-Specific Prequalification Form.
Note: The Owner reserves the right to require from the Bidder, prior to the bid opening, a detailed statement regarding the business and technical organization and the physical facilities and equipment of the Bidder that is available for the Work that is contemplated, information pertaining to financial resources and experience of personnel, and any additional information or documentation necessary to satisfy the Owner that the Bidder is equipped and prepared to finance and perform the Work.

4.5 Owner's Evaluation. The Owner shall evaluate the information provided in the Annual Prequalification Statement and Project-Specific Prequalification Statement. The Bidder's performance on previous projects at the University of Illinois and other available evidence will be used to determine, prior to the opening of bids, whether the Bidder has satisfactorily prequalified to submit a bid for the project. The Owner shall perform all such evaluations in compliance with applicable State and Federal law which define and prohibit unlawful discrimination. Unsatisfactory performance on previous projects may be sufficient cause for disqualifying a Bidder. Any Bidder who is determined to be unqualified on the basis of data submitted and/or investigation completed will be notified at or prior to the bid opening, and any bid submitted will be returned unopened. Prequalification by a Bidder shall not, however, constitute a final determination by the Owner of the qualifications and responsibility of the Bidder. The Owner reserves the right to re-evaluate the Bidder's qualifications and responsibility and to request additional information and substantiation at any time prior to the award of contract.

4.6 Actions Affecting Prequalification. The Owner may, at any time, consider whether action should be taken concerning a Bidder's prequalification. Actions that may be taken by the Owner include, but are not limited to, one or more of the following: modification or limitation of a Bidder's ability to bid; suspension of a Bidder's prequalification; debarment of a Bidder.

5.0 COMPLIANCE WITH LABOR AND EMPLOYMENT LAWS AND REGULATIONS

The successful Bidder will be required to pay the prevailing wages and benefits identified therein, to utilize nondiscriminatory and affirmative action hiring practices, and to comply with all laws, statutes, regulations, ordinances, rulings, or enactments of any governmental authority which are applicable to the Work or to the Project.

6.0 BID PREPARATION AND SUBMISSION

6.1 Preparation. The bid shall be submitted on the form furnished, which shall be used for all contract divisions of the Project. The Bidder shall not make changes in the bid form or bid bond form supplied with the bidding documents. All relevant blanks completed on the bid form shall be typewritten or handwritten in indelible ink. Bidders shall indicate the contract divisions of the Project upon which they are submitting their bid and shall fill in the proper spaces for base bid and alternates for those contract divisions. Where alternates and/or unit prices are required, Bidders shall fill in each alternate and/or unit price applicable to their contract division. Bidder certifies that a signed copy of Certifications and Statutes Requirements form and the Financial Disclosures and Conflicts of Interest form shall be submitted along with the Bid. Copies of these forms can be found at:

https://www.uocpres.uillinois.edu/contractors/contracts

6.2 Minority and Female Business Enterprise Participation.

Each Bidder shall name the MBE/FBE owned firms it intends to use to meet the specified goals set for this project on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form document 00 40 00. The MBE/FBE goals for this project are as follows (N/A in Combined Goal(s) means Split Goals are in effect, and N/A in Split Goals means Combined Goal(s) is in effect for each specified Division of Work):

<table>
<thead>
<tr>
<th>Division of Work</th>
<th>Combined Goal(S)</th>
<th>Split Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MBE/FBE</td>
<td>MBE</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Work Type</th>
<th>Min</th>
<th>Max</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Work</td>
<td>15</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Plumbing Work</td>
<td>15</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Heating A/C Temp Control Work</td>
<td>15</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Electrical Work</td>
<td>15</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Good Faith Effort Period.**

Bidders shall submit within ten (10) calendar days after the bid opening, documentation of their good faith efforts to achieve the MBE/FBE goals if the goals are not met. Failure to submit such documentation, or to use good faith efforts, shall result in rejection of the bid.

**MBE/FBE Participation Cure Period.**

If the Bidders fail to meet the MBE/FBE participation goal at the time of bid submittal, they are granted a cure period of ten (10) calendar days to meet the goal. The cure period shall run concurrently with the Good Faith Effort Period.

6.2.A  **Goal Credit.** Only those vendors who are certified by the Illinois Department of Central Management Services as of the date of the bid opening will be considered in determining whether the vendor meets the participation goal.

6.2.B  **Certification.** Owner will only accept Minority and Female Business Enterprise (MBE/FBE) firms certified by the Illinois Department of Central Management Services (CMS). A current and valid print version of the vendor’s CMS Business Enterprise Program (BEP) Vendor Directory results is printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, certification renewal date and expiration date. If a current and valid CMS BEP certification letter is included with the bid, reconciliation to obtain proper printed proof is allowed. If the CMS BEP certification letter is not current and valid, reconciliation is not permitted.

The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

https://www.uocpres.uillinois.edu/UserFiles/Servers/Server_7758/file/training/wbt/WBTMAFBESearch.swf

6.2.C  **The University of Illinois values the utilization of certified minority and female business enterprises in capital construction. All such enterprises must perform a commercially useful function. Enterprises which might be considered "pass-throughs" or "fronts" are not permitted. Failure to comply with this requirement or false representations may result in termination of contracts related to University capital construction projects and result in criminal and civil penalties.**

6.2.D  **Designated Projects.** Owner may designate projects with MBE/FBE Participation Goals. See above for applicable goals for MBE/FBE participation.

6.2.E  **Bid Form.** Each Bidder shall name, on Attachment B - Minority/Female Business Enterprise Program Requirements of the bid form 00 40 00, the IL CMS certified minority and female owned businesses it intends to use to meet the specified goals. If the specified goals are not met, the Bidder shall check the box on the form to request a change in specified goal or waiver of specified goal. Written evidence of good faith efforts to achieve the goals will be submitted within ten
(10) calendar days after the bid opening. Good faith effort documentation is not required when participation goals have been met.

6.2.F MBE/FBE Bidder. If the Bidder is a minority or female owned business, indicate on Attachment B - Minority/Female Business Enterprise Program Requirements of bid form 00 40 00. Owner encourages MBE/FBE prime Bidders to use MBE/FBE subcontractors/suppliers.

6.2.G Joint Venture. If the Bidder is a joint venture, the percentage of ownership held by the MBE/FBE joint venturer may be used to meet the MBE/FBE goal for the contract.

6.2.H Request for Assistance. If the Bidder needs assistance in locating subcontractors or suppliers to meet the goals, Bidder shall contact Director of Diversity, University Office of Capital Programs and Real Estate Services.

6.2.I Good faith effort documentation supporting a request for change of MBE/FBE goal or waiver of MBE/FBE goal must be submitted. The minimum expected documentation includes, but is not limited to:

6.2.I.1 All information indicating why the specified goal cannot be met.

6.2.I.2 A list of all MBE/FBE firms contacted and the dates they were contacted, including documentation from those firms.

6.2.I.3 Copies of all bid solicitation letters to MBE/FBE firms. Letters shall contain, as a minimum:

6.2.I.3.1 Project title and location;

6.2.I.3.2 Classification of work items for which quotations are requested;

6.2.I.3.3 Date, time, and place quotations are due;

6.2.I.3.4 Returnable acknowledgment of the solicitation.

6.2.I.4 Evidence, such as a log, of telephone contact including time and date of call, telephone number, and name of the person called.

6.2.I.5 All other evidence of good faith efforts made by the Bidder to secure eligible MBE/FBE firms to meet the specified goal. Evidence may include documentation that states the following:

6.2.I.5.1 A reasonable number of MBE/FBE firms were contacted.

6.2.I.5.2 The work selected by the Bidder for allocation to MBE/FBE firms was selected in order to increase the likelihood of achieving the specified goal.

6.2.I.5.3 The Bidder negotiated, in good faith, with the potential MBE/FBE firms by not imposing any conditions which are not similarly imposed on all other subcontractors and suppliers, or by denying benefits ordinarily conferred on subcontractors or suppliers for the type of work for which bids were solicited.

6.2.I.5.4 The services of the referral agencies were used by the Bidder in efforts to achieve the specified goal.

6.2.I.5.5 The Bidder attended Owner pre-bid meeting for the project.

6.2.I.5.6 The Bidder contacted the Director of Diversity for the University of Illinois Office of Capital Programs and Real Estate Services.
Estate Services for assistance or to provide notice of difficulties in completing good faith efforts.

6.2.6 Other relevant information in support of the change/waiver request.

6.2.J Request for Change of Subcontractor or Supplier. Only upon receipt of Notification of Award (NOA) or Notification of Intent to Award (NOIA) the determined responsive and responsible Bidder may make a request for change of a MBE/FBE subcontractor or supplier which it has previously listed on Attachment B Minority/Female Business Enterprise Program Requirements on bid form 00 40 00. All requests shall be in writing on the Contractor's letterhead and submitted with documented evidence of cause to Owner's Director of Diversity, University of Illinois Office for Capital Programs and Real Estate Services. Owner will review each request and may, at its sole discretion, authorize the change.

6.2.J.1 After receipt of NOA and/or NOIA letter, but prior to Contract Execution. The Bidder may request approval of a MBE/FBE subcontractor or supplier other than one listed on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form 00 40 00 provided sufficient information is supplied by the Contractor as deemed appropriate by Director of Diversity, University Office of Capital Programs and Real Estate Services. Owner may require supporting documentation from the MBE/FBE subcontractor or supplier.

6.2.J.2 After Contract Execution. If for any reason an approved MBE/FBE subcontractor or supplier fails to meet its contractual commitment to the Bidder after an award of contract, start of construction, or during construction, the Bidder may request approval of an alternate MBE/FBE subcontractor or supplier. All requests shall be in writing on the Bidder’s letterhead and submitted with documented evidence of cause to Owner’s Director of Diversity, University of Illinois Office of Capital Programs and Real Estate Services. Owner may require supporting documentation from the MBE/FBE subcontractor or supplier.

6.3 Basis of Bid Prices. The Bidders' proposed prices shall be based on the materials, fixtures, furnishings, equipment, and methods specified in the Contract Documents and shall not contain any substitutions, qualifications, or recapitulations of the Work to be done. Certain materials and equipment are specified by manufacturer or trade name and catalog or model number to establish standards of quality and performance and not for the purpose of limiting competition. Proposed product substitutions will not be considered as a basis for awarding contracts but will be evaluated in accordance with paragraph 6.10–Substitutions, of the General Conditions after contracts have been awarded and executed.

6.4 Execution. Bids and bid bonds shall be signed in the firm or corporate name of the Bidder and shall bear the signature of the individual(s) authorized to execute contracts on behalf of the Bidder. All signatures shall be in indelible ink. If the Bidder is a corporation, the bid shall be signed by a duly authorized officer of the corporation, attested to by the secretary, and have the corporate seal affixed thereto. WHERE BIDS ARE SIGNED BY AN AGENT OF THE BIDDER, EVIDENCE OF HIS/HER AUTHORITY TO ACT AS THE BIDDER'S AGENT SHALL ACCOMPANY THE BID. The name of each person signing the bid shall be typed or printed below their signature.

6.5 Delivery. All bids shall be submitted in sealed envelopes identified with the name of the Project, the date of the bid opening, the name of the Bidder, the contract division of the Project to be bid, and shall be addressed to the Owner. Bids shall be delivered to the
Owner at or prior to the date, time, and location specified for the delivery of bids in the Notice to Bidders.

7.0 **BID DEPOSIT**

7.1 **Form of Deposit.** Each bid shall be accompanied by a bid deposit in the amount of five percent (5%) of the bid, in the form of a cashier's check, certified check, or bank draft in current U.S. funds made payable to The Board of Trustees of the University of Illinois, or a bid bond. The bid bond form is included in the bidding documents (refer to Document 00 40 00-Bid). After the bid opening, Bidders may replace other forms of bid deposits with an acceptable bid bond. Submission of a surety not listed in the Bidder’s approved prequalification statement may be rejected.

7.2 **Purpose of Deposit.** The bid deposit shall ensure that the Bidder's prices will remain firm for the time period specified in the bid and that the successful Bidder will, upon the award of a contract to it by the Owner, execute a contract with and provide satisfactory performance and payment bonds to the Owner within the time period specified in the bid.

7.3 **Execution of Bid Bond Form.**

7.3.A **Execution of Bond.** The bid bond shall be executed on the form bound into Document 00 40 00-Bid.

7.3.B **Replacement of Surety.** Should the surety on said bond at anytime fail financially or be, in the opinion of the Owner, insufficient security for the penalty of said bond, the Owner may, in writing, require said Bidder to furnish a replacement bond thereon, and it shall be satisfactory to the Owner. If the bond has to be replaced, the Bidder must immediately resubmit a prequalification statement to the Campus Construction Unit where the Bidder is submitting a bid.

7.3.C **Surety Ratings.** The bid bond shall be placed with a surety company having a policyholder’s rating not lower than “A-” and a financial rating not lower than “VI” in the current edition of *Best’s Key Rating Guide* for property/casualty insurance companies. The Bidder’s surety shall also be licensed to write surety bonds in the State of Illinois and shall be listed on the United States’ Department of the Treasury’s Listing of Approved Sureties (Department Circular 570), and shall have an underwriting limitation in an amount not less than the amount bid by Bidder including all alternates, if any.

7.4 **Return of Deposits.** The bid deposits of the successful Bidder and all other Bidders will be returned to them when and as stipulated in the bid, except for those deposits which become the property of the Owner as liquidated damages for any of the reasons specified in the bid.

8.0 **BID MODIFICATION AND WITHDRAWAL**

8.1 **Modification Prior to Bid Opening.** Bid modifications shall be made in writing and will be considered only if received by the Owner at the location designated for and prior to the date and time specified for the delivery of bids. The words "Bid Modification" shall be prominently incorporated thereon so that the modification can be attached to the proper bid. Bid modifications shall not reveal the bid price, but shall identify a sum to be added to or subtracted from the base bid or the alternate bid to be modified so that the final bid price can be determined only after the sealed bid is opened. Written bid modifications may be conveyed by electronic facsimile, by telegram, or within a sealed envelope, subject to confirmation as noted herein. Telephonic or oral modifications will not be considered.

8.2 **Withdrawal Prior to the Bid Opening.** Bid withdrawals shall be made in writing or in person. Personal bid withdrawals shall be made by securing the bid, with proper identification, at any time prior to the date and time specified for the delivery of bids. Written bid withdrawals will be considered only if received by the Owner at the location
designated for and prior to the date and time specified for the delivery of bids. Written bid withdrawals may be conveyed by electronic facsimile or by telegram, subject to confirmation as noted herein. Telephonic requests to withdraw a bid will not be considered.

8.3 Written Confirmation of Electronic Facsimiles and Telegrams. When bid modifications or withdrawals are conveyed by electronic facsimile or by telegram, a written confirmation letter shall be executed in the same manner as the original bid and sent to the Owner by registered or certified mail prior to the date and time stated for the receipt of bids. The confirmation letter shall bear sufficient evidence to confirm the date and time of receipt by the U.S. Postal Service and must be received by the Owner at the location designated for the delivery of the bid within five (5) business days of the bid opening. If the above requirements are not met, no consideration will be given to the electronic facsimile or telegraphic conveyance. The Owner may, at its discretion, publicly read any withdrawn bid pending receipt of the confirmation letter, reject a bid, retain the bid deposit until the confirmation letter is received or the validity or fraudulence of the electronic facsimile or telegraphic conveyance is established beyond a reasonable doubt, and take other such actions that it deems necessary and appropriate to protect against fraud or wrongdoing in the bidding process.

8.4 Withdrawal Subsequent to the Bid Opening. Withdrawal of bids after the bid opening will not ordinarily be permitted. However, in those cases where, pursuant to a written request by the Bidder and subject to the determination of the Professional Services Consultant and the Owner that, based on clear and demonstrable evidence, the Bidder has made a bona fide error in the preparation of the bid which will result in a substantial financial loss or hardship to the Bidder, an exception may be made.

9.0 BID OPENING
Immediately after the closing time for receiving bids, all bids will be publicly opened, read, and tabulated. Bids received after closing time will be returned unopened. The public opening and reading is for information only and is not to be construed as acceptance or rejection of any bid.

10.0 BID ACCEPTANCE OR REJECTION
The Owner reserves the right to reject any or all bids or any part thereof, to waive any informalities in the bidding, and to accept the bids deemed to be in the best interests of the Owner after all bids have been examined and evaluated.

10.1 Owner's Rights. When, in its opinion, it is in the best interest of the University, Owner reserves the right to:

10.1.A Accept or reject any or all bids in accordance with these documents and applicable laws

10.1.B Waive technical deficiencies and irregularities

10.1.C Allow Bidder to remedy technical deficiencies or irregularities within a stated time

10.1.D Rescind any notice of award if Owner determines the notice of award was issued in error

10.1.E Cancel any solicitation or rescind any notice of award when it is in the best interest of the State

10.1.F Rebid any contract

10.2 Bid Rejection.

10.2.A Material Deficiencies. Bids will be rejected for material deficiencies, including but not limited to:
10.2.A.1 Failure to be prequalified with Owner no later than the close of business the day before the bid opening (Section 4.2 and Section 4.4).

10.2.A.2 Being determined non-responsible after bid opening as defined by 30 ILCS 500/30-22 and 44 IL Admin Code 526.2046.

10.2.A.3 Submission of a bid late (Section 9.0).

10.2.A.4 Failure to attend a mandatory pre-bid meeting.

10.2.A.5 Failure to submit a completed Owner bid form 00 40 00 including Attachment B – Minority/Female Business Enterprise Program Requirements.

10.2.A.6 Failure to use good faith efforts to achieve minority/female business enterprise participation goals as required in Section 6.2 of Document 00 20 00 – General Instructions to Bidders and provide documentation of good faith efforts within ten (10) calendar days after bid opening.

10.2.A.7 Failure to register with the State Board of Elections in accord with 30 ILCS 500/20-160, if required. Vendor must be registered at the time of bid. A copy of the certificate of registration is not required with the bid.

10.2.A.8 Failure to submit Certifications and Statutory Requirements form.

10.2.A.9 Failure to submit Financial Disclosures and Conflicts of Interest form.

10.2.A.10 Failure to submit a bid deposit.

10.2.A.11 Failure to include a current and valid printed proof of CMS certification for each identified MBE/FBE vendor as per Section 1.4.A of Document 00 40 00 within ten (10) calendar days after bid opening. A printed vendor’s CMS BEP Vendor Directory document should be the printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, and certification, renewal and expiration dates.

The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

https://www.uocpres.uiuillinois.edu/UserFiles/Servers/Server_7758/file/training/wbt/WBTMAFBESearch.swf

10.2.B Technical Deficiencies. When identified by Owner, technical deficiencies may be remedied by the Bidder within ten (10) calendar days of notification. Failure to remedy the bid within ten (10) calendar days may result in rejection of the bid.

10.2.C Owner, at its sole discretion and without conferring any rights on any Bidder, may waive bid technical deficiencies or irregularities that are not in conformance with the bidding documents but whose non-conformance is non-material or minor.

Submittal of conditions or qualifying statements contrary to Owner’s contract terms is not acceptable and, unless rescinded, the bid shall be rejected.

11.0 METHOD OF AWARD
Contracts will be awarded to qualified, responsive, and responsible Bidders that submit the lowest priced bid based on the sum of the base bids and alternates accepted by the Owner. The Owner will not split the award of the base bids and alternates between different Bidders within a particular contract division of the project. Alternates, if considered, will be accepted in any order, as determined by the Owner. The Owner does not obligate itself to accept the lowest or any other bid.

12.0 MBE/FBE BUSINESS CERTIFICATION, POST REQUIREMENTS

12.1 Post-Award Submittal. Following the receipt of the Notice of Intent to Award or Notice of Award letter, the contractor shall submit Attachment A - MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter, for each of the IL CMS certified MBE/FBE subcontractor(s) and/or supplier(s) being utilized to meet the designated participation goals as specified on the bid form. The form must be signed by the MBE/FBE subcontractor or supplier and shall be submitted by the Bidder to the Campus Construction Unit (CCU).

12.2 Completion of the Attachment A MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter. Attachment A – MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter is not required if the Bidder is a MBE or FBE firm. MBE/FBE Bidders are encouraged to utilize MBE/FBE subcontractors/suppliers. If goals are split (separate MBE and FBE goals), then a MBE or FBE firm must supply Attachment A – MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter for the subcontractor firm(s) utilized to meet the FBE or MBE goal, respectively.

12.3 Listed Firms. Attachment A – MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter shall be completed and submitted for each MBE/FBE firm listed on Attachment B of the bid form. The awarded contractor shall ensure the firm(s) and dollar amount(s) listed on the completed Attachment A – MBE/FBE Subcontractor/Supplier Certification form matches the firm(s) and dollar amount(s) listed on Attachment B of the bid form including any additional firms and/or dollar amounts associated with alternates.

12.4 Compliance. The MBE/FBE participation goal dollar value is based upon the total contract sum (including awarded alternates). The participation goal percentage amount(s) shall meet or exceed the goal(s) as specified on the bid form, or in an approved change/waiver request (refer to Section 6.2 herein).

12.5 Voluntary. Bidders are encouraged to utilize MBE/FBE subcontractors/suppliers for those projects that are not designated for MBE/FBE participation and complete Attachment A - MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter for each MBE/FBE firm. MBE/FBE subcontractors/suppliers may be added at any time during the project.

13.0 POST AWARD REQUIREMENTS

13.1 Bidder's Duty to Comply. The Bidder may not proceed with the Work until the following post award requirements are met. These requirements are part of the contract and failure to comply with these requirements shall constitute a breach of the contract. Owner shall issue Notice to Proceed upon successful completion of these post award requirements.

13.2 Submittals. Within fifteen (15) calendar days from the date of the Notice of Award, or Notice of Intent to Award letter, the Bidder shall furnish, on Owner forms, the following:

13.2.A.1 Contract executed by the Bidder;
13.2.A.2 Contractor Performance Bond;
13.2.A.3 Contractor Payment Bond;
13.2.A.4 Certificate of Insurance;
13.2.A.5 Builder's Risk Insurance (if applicable);
13.2.A.6 Substance Abuse Prevention Program (if the program has been revised since submitted with the annual prequalification).

13.2.B MBE/FBE Subcontractor/Supplier Documentation (if MBE/FBE is utilized). Attachment A – MBE/FBE Subcontractor/Supplier Certification form, of the Notice of Intent to Award or Notice of Award letter. The awarded Bidder shall ensure the firm(s) and dollar amount(s) listed on the completed Attachment A – MBE/FBE Subcontractor/Supplier Certification form matches the firm(s) and dollar amount(s) listed on bid form 00 40 00 Attachment B – Minority/Female Business Enterprise Program Requirements, including any additional firms and/or dollars associated with alternates.

13.3 Cancellation of Award. All post award requirements are mandatory. Noncompliance shall be cause for Owner to cancel the Notice of Award and make a claim against the bid security.

13.4 Post Award Extensions. Owner may extend the time limitations for good cause. No extension shall operate as a waiver of post award requirements, nor shall it extend the contract completion date.

14.0 DELAYS

Any delays to the commencement of the Work due to the Contractor’s failure to meet the post award requirements shall be the responsibility of the Contractor and its surety. Contractor and its surety shall be responsible for the costs of any such delays.

END OF DOCUMENT 00 20 00
THE BIDDING AND CONTRACT PROVISIONS

DOCUMENT 00 40 00 - BID

(Standard Multiple Contract Set)

Ice Arena - Portable Ice Refrigeration System
at the
UNIVERSITY OF ILLINOIS
Urbana-Champaign
Project Number: U15086

Bid Date: ______________________

Facilities and Services
1501 South Oak Street, Room 115
Champaign, IL 61820

Bid Submitted By:

Bidder: ____________________________________________

Business Address ______________________________________

_____________________________________________________

Phone

Email Address _________________________________________

Contract Division of the Project: __________________________

Bids for Contract Divisions 02 - Plumbing Work, 03 - Heating A/C Temp Control Work, 05 - Electrical Work will be opened in Physical Plant Services Building, 1501 South Oak Street, Room 128 Champaign, IL 61820 at 2:00 PM on 12/18/15.

Bids for Contract Division 01 - General Work will be opened in Physical Plant Services Building, 1501 South Oak Street, Room 128 Champaign, IL 61820 at 2:30 PM on 12/22/15.
1.0 PROJECTION OF EMPLOYEE UTILIZATION

1.1 Workforce Projection. The Bidder has analyzed minority group and female populations, unemployment rates, and availability of workers for the location in which this contract work is to be performed, and for the locations from which the Bidder recruits employees, and hereby submits the following workforce projection, (see Attachment A) including a projection for minority and female employee utilization in all job categories in the workforce to be allocated to this contract.

1.2 New Employees. Included in "Total Employees" under Attachment A is the total number of new hires that will be employed in the event the Bidder is awarded this contract. The Bidder projects that the new hires listed in Table 3 will be recruited from the area in which the Project is located and/or the area in which the Bidder's principal office or base of operation is located.

1.3 Affirmative Action Plan. The Bidder agrees to comply fully with the Equal Employment Opportunity Act (775 ILCS 5/2-105). The Bidder further agrees, in the event the foregoing minority and female employee utilization projection is determined to be an underutilization of minority persons or females in any job category and in the event that the Bidder is awarded this contract, to develop and submit a written Affirmative Action Plan prior to the commencement of work on this contract. The Affirmative Action Plan shall have a specific timetable, geared to the completion stages of the contract, whereby deficiencies in minority and/or female employee utilization are corrected and shall be subject to approval by the Owner and the Illinois Department of Human Rights.


1.4.A This project has goals for participation by minority and female owned businesses as bidders, subcontractors or suppliers in accordance with the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. Only MBE/FBE/FMB firms certified with the Illinois Department of Central Management Services (CMS) are acceptable. Printed proof of current and valid CMS MBE/FBE/FMB certification must be provided with the bid for each identified MBE/FBE vendor. A print version of the vendor's CMS Business Enterprise Program (BEP) Vendor Directory results is printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, and certification renewal date and expiration date. If a current and valid CMS BEP certification letter is included with the bid, reconciliation to obtain proper printed proof is allowed. If the CMS BEP certification letter is not current and valid, reconciliation is not permitted. The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

https://www.uocpres.uillinois.edu/UserFiles/Servers/Server_7758/file/training/wbt/WBTMAFBESearch.swf

NOTE: MBE/FBE goals are separate and distinct from workforce projections (Attachment A of Document 00 40 00).

Each Bidder shall name the MBE/FBE owned subcontractors and suppliers it intends to use to meet the specified goals set for this project on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form document 00 40 00. The MBE/FBE goals for this project are as follows (N/A in Combined Goal(s) means Split Goals are in effect, and N/A in Split Goals means Combined Goal(s) is in effect for each specified Division of Work):
### Good Faith Effort Period

The Bidder shall submit within ten (10) calendar days after the bid opening, documentation of its good faith efforts to achieve the MBE/FBE goals if the goals are not met (see General Instructions to Bidders, Document 00 20 00). Failure to submit such documentation, or to use good faith efforts, shall result in rejection of the bid.

### MBE/FBE Participation Cure Period

If the Bidders fail to meet the MBE/FBE participation goal at the time of bid submittal, they are granted a cure period of ten (10) calendar days to meet the goal. The cure period shall run concurrently with the Good Faith Effort Period.

1.4.B **Goal Credit.** Only those vendors who are certified by the Illinois Department of Central Management Services as of the date of the bid opening will be considered in determining whether the vendor meets the participation goal.

1.4.C Bidders may request assistance in locating MBE/FBE businesses from the Director of Diversity, University Office of Capital Programs and Real Estate Services (http://www.uocpres.uillinois.edu/about/contact.)

1.4.D Once the contract is awarded, the awarded contractor is required to submit, in accordance with General Instructions document 00 20 00 a completed Attachment A - MBE/FBE Subcontractor/Supplier Certification Form of the Notice of Intent to Award or Notice of Award letter for each of the MBE/FBE subcontractors/suppliers utilized to meet the goals.

1.4.E The MBE/FBE business named and subcontract dollar amount on the two forms (Attachment B – Minority/Female Business Enterprise Program Requirements of bid form document 00 40 00 and Attachment A - MBE/FBE Subcontractor/Supplier Certification Form of the Notice of Intent to Award or Notice of Award letter) must match.

### 1.5 Minority and Female Business Enterprise Participation

1.5.A **Certification.** Owner will only accept Minority and Female Business Enterprise (MBE/FBE) firms certified by the Illinois Department of Central Management Services (CMS). A current and valid print version of the vendor’s CMS Business Enterprise Program (BEP) Vendor Directory is the printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, certification renewal date and expiration date. If a current and valid CMS BEP certification letter is included with the bid, reconciliation to obtain proper printed proof is allowed. If the CMS BEP certification letter is not current and valid, reconciliation is not permitted.

The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

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<table>
<thead>
<tr>
<th>Division of Work</th>
<th>Combined Goal(s)</th>
<th>Split Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MBE/FBE</td>
<td>MBE</td>
</tr>
<tr>
<td>01 - General Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>02 - Plumbing Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>03 - Heating A/C Temp Control Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>05 - Electrical Work</td>
<td>15</td>
<td>N/A</td>
</tr>
</tbody>
</table>
1.5.B The University of Illinois values the utilization of certified minority and female business enterprises in capital construction. All such enterprises must perform a commercially useful function. Enterprises which might be considered "pass-throughs" or "fronts" are not permitted. Failure to comply with this requirement or false representations may result in termination of contracts related to University capital construction projects and result in criminal and civil penalties.

1.5.C Designated Projects. Owner may designate projects with MBE/FBE Participation Goals. See above for applicable goals for MBE/FBE participation.

1.5.D Bid Form. Each Bidder shall name, on Attachment B-Minority/Female Business Enterprise Program Requirements of the bid form 00 40 00 the IL CMS certified minority and female owned businesses it intends to use to meet the specified goals. If the specified goals are not met, the Bidder shall check the box on the form to request a change in specified goal or waiver of specified goal, indicating written evidence of good faith efforts to achieve the goals will be submitted within ten (10) calendar days after the bid opening. (Not required when participation goals have been met or are not applicable)

1.5.E MBE/FBE Bidder. If the Bidder is a minority or female owned business, indicate on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form 00 40 00. Owner encourages MBE/FBE prime Bidders to use MBE/FBE subcontractors/suppliers.

1.5.F Joint Venture. If the Bidder is a joint venture, the percentage of ownership held by the MBE/FBE joint venturer may be used to meet the MBE/FBE goal for the contract.

1.5.G Subcontracts. Subcontracting of Work to a lower tier non-MBE/FBE firm which would reduce the proceeds received by the subcontracting MBE/FBE firm below the specified goal is prohibited. Owner may, in such cases, reject the bid or terminate the contract.

1.5.H Request for Assistance. If the Bidder needs assistance in locating subcontractors or suppliers to meet the goals, Bidder shall contact the Director of Diversity, University Office of Capital Programs and Real Estate Services.

1.5.I Good faith effort documentation supporting a request for change of MBE/FBE goal or waiver MBE/FBE goal must be submitted. The minimum expected documentation includes, but is not limited to:

1.5.I.1 All information indicating why the specified goal cannot be met.

1.5.I.2 A list of all MBE/FBE firms contacted and the dates they were contacted, including documentation from those firms.

1.5.I.3 Copies of all bid solicitation letters to MBE/FBE firms. Letters shall contain, as a minimum:

1.5.I.3.1 Project title and location

1.5.I.3.2 Classification of Work items for which quotations are requested

1.5.I.3.3 Date, time, and place quotations are due

1.5.I.3.4 Returnable acknowledgment of the solicitation

1.5.I.4 Evidence, such as a log, of telephone contact including time and date of call, telephone number, and name of the person called.
1.5.I.5 All other evidence of good faith efforts made by the Bidder to secure eligible MBE/FBE firms to meet the specified goal. Evidence may include documentation that states the following:

1.5.I.5.1 A reasonable number of MBE/FBE firms were contacted.

1.5.I.5.2 The Work selected by the Bidder for allocation to MBE/FBE firms was selected in order to increase the likelihood of achieving the specified goal.

1.5.I.5.3 The Bidder negotiated, in good faith, with the potential MBE/FBE firms by not imposing any conditions which are not similarly imposed on all other subcontractors and suppliers, or by denying benefits ordinarily conferred on subcontractors or suppliers for the type of Work for which bids were solicited.

1.5.I.5.4 The services of the referral agencies were used by the Bidder in efforts to achieve the specified goal.

1.5.I.5.5 The Bidder attended Owner pre-bid meeting for the project.

1.5.I.5.6 The Bidder contacted the Director of Diversity for the University of Illinois Office for Capital Program and Real Estate Services for assistance or to provide notice of difficulties in completing Good Faith Efforts.

1.5.I.6 Other relevant information in support of the change/waiver request.

1.5.J Request for Change of Subcontractor or Supplier. Only upon receipt of Notification of Award (NOA) or Notification of Intent to Award (NOIA) the determined responsive and responsible Bidder may make a request for change of a MBE/FBE subcontractor or supplier which it has previously listed on Attachment B Minority/Female Business Enterprise Program Requirements on bid form 00 40 00. All requests shall be in writing on the Contractor’s letterhead and submitted with documented evidence of cause to Owner’s Director of Diversity for University Office of Capital Programs and Real Estate Services. Owner will review each request and may, at its sole discretion, authorize the change.

1.5.J.1 After receipt of NOA and/or NOIA letter, but Prior to Contract Execution. The Bidder may request approval of an MBE/FBE subcontractor or supplier other than one listed on Attachment B – Minority/Female Business Enterprise Program Requirements of bid form 00 40 00 provided sufficient information is supplied by the Contractor as deemed appropriate by Director of Diversity, University Office of Capital Programs and Real Estate Services. Owner may require supporting documentation from the MBE/FBE subcontractor or supplier.

1.5.J.2 After Contract Execution. If for any reason an approved MBE/FBE subcontractor or supplier fails to meet its contractual commitment to the Bidder after an award of contract, start of construction, or during construction, the Bidder may request approval of an alternate MBE/FBE subcontractor or supplier. All requests shall be in writing on the Bidder’s letterhead and submitted with documented evidence of cause to Owner’s Director of Diversity, University of Illinois Office of Capital Programs and Real Estate Services. Owner may require
supporting documentation from the MBE/FBE subcontractor or supplier.

2.0 CERTIFICATION OF EEO INFORMATION

The Bidder certifies that, to the best of its knowledge and belief, the workforce projection is accurate and complete and that the Bidder is not currently under suspension by the Illinois Department of Human Rights or declared ineligible by said Department to enter into a contract with the Owner.

3.0 UNUSED

4.0 RECEIPT OF ADDENDA

The Bidder acknowledges receipt of the following addenda:

#____ dated ___________  #____ dated ___________  #____ dated ___________
#____ dated ___________  #____ dated ___________  #____ dated ___________
#____ dated ___________  #____ dated ___________  #____ dated ___________

5.0 EXAMINATION OF PROJECT SITE AND CONTRACT DOCUMENTS

The Bidder has visited the site and has become thoroughly familiarized with the local conditions affecting the cost of the work, the Contract Documents entitled:

Ice Arena - Portable Ice Refrigeration System
dated: 11/18/15, prepared by: Legat Architects, Inc.

(including the agreement forms, the General Conditions, the specifications and drawings), this bid (if and as accepted by The Board of Trustees of the University of Illinois), the bidding instructions (including the Notice to Bidders and the General Instructions to Bidders) which are hereby incorporated into this bid, and all addenda thereto.

6.0 BID PRICES

The Bidder hereby bids to furnish all labor, materials, equipment, transportation, construction plant and facilities necessary to complete, in a workmanlike manner and in accordance with the Contract Documents, the Contract Division Work bid upon herein for compensation in accordance with the following prices:

NOTE: Owner will consider any Alternate bid prices left blank, marked “N/A” or “No Bid” or other indication that an additional cost is not identified by the bidder to be Zero Dollar ($0.00) bids. Alternates, if considered, will be accepted in any order as determined by the Owner. Bid alternates use a numbering scheme for identification only, not for prioritization.

6.1 01 - General Work

6.1.A Base Bid

All Division 01 - General Work Base Bid Work for the fixed sum of:

$_____________.

6.2 02 - Plumbing Work

6.2.A Base Bid

All Division 02 - Plumbing Work Base Bid Work for the fixed sum of:

$_____________.

6.3 03 - Heating A/C Temp Control Work

6.3.A Base Bid
All Division 03 - Heating A/C Temp Control Work Base Bid Work for the fixed sum of:

______________________________ Dollars ($_____________).

6.4 05 - Electrical Work
6.4.A Base Bid

All Division 05 - Electrical Work Base Bid Work for the fixed sum of:

______________________________ Dollars ($_____________).

7.0 CONTRACT TIME

7.1 Starting Date. The Bidder for Contract Division 01 - General Work hereby agrees that, if awarded a contract for the Work bid upon herein, the Bidder shall commence the Work on the date specified in a written Notice to Proceed from the Owner.

Completion Date. Time is of the essence in this contract. The Bidder agrees to achieve Substantial Completion of the Work bid upon as expeditiously as the Work will permit, in such a manner as to cause no delay to any of the other contractors employed in the Work or to the completion of the Work as a whole and, subject to adjustments as provided by the Contract Documents, no later than 162 calendar days from the date specified in the Notice to Proceed (the “Substantial Completion Date”).

The Bidder agrees to achieve Final Completion of the Work bid upon within thirty (30) days after Substantial Completion. Neither the Substantial Completion Date nor the time for Final Completion shall be changed except by Change Order issued in accordance with the terms of the Contract Documents.

7.2 Starting Date. The Bidder(s) for Contract Division(s) 02 - Plumbing Work, 03 - Heating A/C Temp Control Work, 05 - Electrical Work hereby agree(s) that, if awarded a contract for the work bid for herein, the Bidder(s) shall commence the Work on the date specified in a written Notice to Proceed from the Owner.

Completion Date. Time is of the essence in this contract. The Bidder(s) agree(s) to achieve Substantial Completion of its Work as expeditiously as the Work will permit, in such a manner as to cause no delay to any of the other contractors employed in the Work or to the completion of the Work as a whole.

8.0 ASSIGNMENT OF CONTRACTS

8.1 The Bidder for Contract Division(s) 02 - Plumbing Work, 03 - Heating A/C Temp Control Work, 05 - Electrical Work hereby agrees that, if awarded the contract by Owner for the Work bid upon herein, the Bidder's contract (including all of the Bidder's rights against, and duties and obligations to the Owner thereunder) will be assigned to the Contract Division 01 - General Work Contractor who thereupon shall succeed to all the rights and obligations of the Owner under such assigned contract and who shall be obligated to the Owner for the performance of such assigned contract in accordance with its terms and conditions and shall acquire all rights under the contract against the Owner.

8.2 The Bidder for the Contract Division 01 hereby agrees that, if awarded the contract for the General Work Work by the Owner, it will accept the assignment of Contract Division(s) 02 - Plumbing Work, 03 - Heating A/C Temp Control Work, 05 - Electrical Work contract(s). The Bidder further agrees that the full amount of compensation for this acceptance is included in the base bid.

9.0 CONTRACTOR'S FEES FOR CHANGES IN THE WORK

9.1 Lump Sum or Time and Materials Changes. The Bidder agrees that the following percentages for overhead and profit shall be added to, or as applicable, deleted from, job
costs for the net amount of work added to or deleted from the contract by written lump
sum or time and material change orders approved by the Owner in accordance with
Article 13 of the General Conditions. Insurance, bond, and taxes are considered as job
cost items and are not included in the percentages listed below. In any one quotation for
added work involving a series of Subcontractors, the cumulative percentages for the
Contractor’s and Subcontractor’s overhead and profit shall not exceed twenty-five
percent (25%). All costs shall be net costs including discounts realized by the Contractor.

9.1.A  Add to net extra job costs for added work to be performed by:
      1) Contractor’s own forces  15 %  2) Subcontractors  5 %
      (including Assigned Subcontractors)

9.1.B Add to net credit for job costs for deleted work originally to have been performed
      by:
      1) Contractor’s own forces  5 %  2) Subcontractors  0 %
      (including Assigned Subcontractors)

9.2  Unit Price Changes. The Bidder agrees that all unit price change orders will be based on
      the unit prices proposed herein as accepted by the Owner in the contract, that the unit
      prices include the Bidder’s overhead and profit for all work to be performed on the unit
      price basis, and that the above-listed percentages will not be applied to unit price
      changes.

10.0  BID DEPOSIT

10.1  A bid deposit is enclosed herewith in the form of a certified check, cashier’s check, or
      bank draft in current U.S. funds made payable to the Board of Trustees of the University
      of Illinois, or a bid bond (on the form attached hereto). The enclosed bid deposit is in the
      amount indicated on the following schedule, and a separate deposit is included for each
      Contract Division bid upon herein:

<table>
<thead>
<tr>
<th>Contract Division</th>
<th>Bid Deposit</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 - General Work</td>
<td>5% of base bid</td>
</tr>
<tr>
<td>02 - Plumbing Work</td>
<td>5% of base bid</td>
</tr>
<tr>
<td>03 - Heating A/C Temp Control Work</td>
<td>5% of base bid</td>
</tr>
<tr>
<td>05 - Electrical Work</td>
<td>5% of base bid</td>
</tr>
</tbody>
</table>

10.2  The Bidder further agrees that the enclosed bid deposit is the measure of liquidated
      damages which the Owner will sustain and that the proceeds therof shall become the
      property of Owner if for any reason the Bidder:

10.2.A Withdraws its bid after the opening of the bids and prior to the time a formal
      written agreement evidencing the contract has been signed and delivered to
      Owner and a satisfactory performance bond and payment bond has been
      furnished to Owner whether or not the Bidder at the time of such withdrawal has
      been designated as the successful bidder; or

10.2.B Fails to properly execute, furnish, and deliver to the Owner both (1) the written
      agreement formally evidencing the contract and (2) the performance bond and
      payment bond required by the Contract Documents within fifteen (15) days after
      receiving the written Notice of Award and the above-mentioned documents from
      the Owner.

10.3  The Bidder agrees that withdrawal of this bid, or failure, upon receipt of a written Notice
      of Award, to sign the agreement or furnish a satisfactory performance bond and payment
      bond within fifteen (15) days from written Notice of Award shall automatically bar the
      Bidder from any further consideration and terminate any and all rights the Bidder may
      have acquired in, by, or through this bid.
10.4 The Bidder agrees that if the Bidder is one of the two lowest bidders in its contract division, its bid shall remain valid and open for acceptance by the Owner, and the Owner shall have the right to retain the bid deposit, for a period of ninety (90) days from the bid opening date. The Bidder further guarantees the prices bid herein to be firm for the same ninety (90) days. At the expiration of this period (or earlier at the Owner's option), the Bidder understands that said bid deposit shall be returned, unless it has become the property of the Owner as liquidated damages. If the Bidder is not one of the two lowest bidders in its contract division, the Bidder understands that the bid deposit will be returned within ten (10) days from the bid opening date.

11.0 STATE CONTRACT CERTIFICATION

11.1 Bidder certifies that the Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form have been fully and properly completed and signed and have been submitted along with the Bid. Copies of these forms can be found at:

http://www.uocpres.uiuc.edu/contractors/contracts

If granted a Contract, Bidder shall provide all required forms completed by subcontractor(s) as required in 00 50 00 – Standard Contract Execution Forms, Article 8 Constitutional and Statutory Provisions.
<table>
<thead>
<tr>
<th>Type of Business Organization</th>
<th>Bidder's Signatures*</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Sole Proprietorship</td>
<td>Firm Name ____________________________</td>
</tr>
<tr>
<td>☐ Partnership</td>
<td>Address ____________________________</td>
</tr>
<tr>
<td>☐ Corporation</td>
<td>____________________________________</td>
</tr>
</tbody>
</table>

By___________________________________________  
Title__________________________________________

By___________________________________________  
Title__________________________________________

*Bidder's agents shall attach evidence of their authority to sign.
BID BOND

PROJECT: Ice Arena - Portable Ice Refrigeration System
CAMPUS: Urbana-Champaign

KNOW ALL MEN BY THESE PRESENTS: That we_______________________________ (Name and Address of Bidder), a _______________________________________(Form of Business), as Bidder and Principal, and _________________________________________(Surety), a corporation organized and existing under and by virtue of the laws of the State of _____________, and authorized to do business in the State of Illinois, as Surety, are held and firmly bound unto THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, hereinafter called the Owner, in the penal sum of ______________________ (Total amount in words) Dollars ($____________) lawful money of the United States, well and truly to be paid and for the payment of which we bind ourselves, our successors and assigns, jointly, severally, and firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, that whereas the said Principal has submitted a written bid dated ______________(Date) to the Owner for the construction of the work designated as _____________________________________(Contract Division), shown on the drawings and described in the specifications entitled, Ice Arena - Portable Ice Refrigeration System, dated 11/18/15, prepared by Legat Architects, Inc., 651 W. Washington Blvd., Suite 1, Chicago IL 60661.

NOW, THEREFORE, the Principal and Surety on this bond agree that:

If the Principal shall, upon acceptance by the Owner of its bid within the period of time specified for acceptance, execute a written Agreement with the Owner and give such bonds and other items as are required by the terms of the bid within the time specified, or in the event of the failure to comply with the terms of the bid, if the Principal or Surety shall pay Owner the penal sum of this Bid Bond, then this obligation shall be null and void; otherwise to remain in full force and effect; provided however, that in the event of (a) said failure, and (b) the failure of the Principal or Surety to promptly pay Owner as herein provided, the Principal and the Surety shall be liable to Owner for the full penal sum of this Bid Bond, not as a penalty but as liquidated damages for said failures the actual amount of such damages being difficult, if not impossible, to accurately ascertain.

IN WITNESS WHEREOF, the aforesaid Principal and Surety have executed this instrument hereto this _______ day of __________________________.

Principal
By:
Title:

Corporate Surety
By:
Title:

(Power of Attorney of person signing for Surety must be attached.)
### Attachment A: Contractor’s Workforce (includes Direct Subcontractors)

#### TABLE 1

<table>
<thead>
<tr>
<th>Trade Codes</th>
<th>Job Titles</th>
<th>Total Employee</th>
<th>Black/African American</th>
<th>Hispanic American</th>
<th>Asian American</th>
<th>Native American/Alaskan Native</th>
<th>M</th>
<th>F</th>
<th>M</th>
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<th>M</th>
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<tr>
<td>G1</td>
<td>Laborers</td>
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#### TABLE 2

<table>
<thead>
<tr>
<th>Current Employees to be Assigned to Contract</th>
<th>Total</th>
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<tr>
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</table>

#### TABLE 3: BREAKDOWN OF APPRENTICES, OJT’S & NEW HIRES

<table>
<thead>
<tr>
<th>OJT’s &amp; Apprentices</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hires</td>
<td></td>
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</tbody>
</table>
Attachment B – Minority/Female Business Enterprise Program Requirements

Project: Ice Arena - Portable Ice Refrigeration System - U15086

Bidder Name: ____________________________ Division of Work: __________________

Contract Requirements for Minority/Female Business Participation

**MBE/FBE Goals:** This project has goals for participation by minority and female owned businesses as bidders, subcontractors or suppliers in accordance with the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. Only MBE/FBE firms certified with the Illinois Department of Central Management Services (CMS) are acceptable. NOTES: (1) MBE/FBE goals are separate and distinct from workforce projections (Attachment A of Document 00 40 00). (2) N/A in Combined Goal(s) means Split Goals are in effect, and N/A in Split Goals means Combined Goal(s) is in effect for each specified Division of Work.

<table>
<thead>
<tr>
<th>Division of Work</th>
<th>Combined Goal(s)</th>
<th>Split Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MBE/FBE</td>
<td>MBE</td>
</tr>
<tr>
<td>01 - General Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>02 - Plumbing Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>03 - Heating A/C Temp Control Work</td>
<td>15</td>
<td>N/A</td>
</tr>
<tr>
<td>05 - Electrical Work</td>
<td>15</td>
<td>N/A</td>
</tr>
</tbody>
</table>

If the MBE/FBE goals are not met, the Bidder shall submit within ten (10) calendar days after the bid opening documentation of its good faith efforts to achieve the MBE/FBE goals (See General Instructions to Bidders, Document 00 20 00). Failure to submit such documentation, or to use good faith efforts, shall result in rejection of the bid.

**Instructions:** The Bidder shall include below the names of ONLY IL CMS certified minority/female owned business enterprises. These firms will perform at least the percentage of the work specified in the goals listed above and the proposed dollar value of subcontract (percentage values are not acceptable). If Bidder is MBE/FBE, include Bidder’s information (total proposed bid value) as well as any additional MBE/FBE subcontractor information in table below. If the Bidder needs assistance in identifying subcontractors or suppliers, contact Owner’s Director of Diversity for University Office of Capital Programs and Real Estate Services prior to submitting the bid and assistance will be provided in accordance with the MBE/FBE requirements in the Contract Documents. Efforts to comply with these requirements will be considered in evaluating whether the bid is responsive. If the percentage of the work is less than the specified goals, Bidder is required to submit within ten (10) calendar days after the bid opening written evidence of its good faith efforts to achieve the goals.

**List the bidder’s MBE/FBE subcontractor/supplier firms which are to be utilized in regard to this contract below.** A current and valid print version of the vendor’s CMS Business Enterprise Program (BEP) Vendor Directory results is printed proof of the CMS MBE/FBE/FMB certification. This document includes the vendor name, address, ethnicity, county, contact information, and certification renewal date and expiration date.

The IL CMS BEP Vendor Directory can be found at

https://www.illinois.gov/cms/business/sell2/Pages/VendorSearch.aspx

and a tutorial for using the directory is available at

https://www.uocpres.uillinois.edu/UserFiles/Servers/Server_7758/file/training/wbt/WBTMAFBESearch.swf

All MBE/FBE firms must be certified with Illinois Department of Central Management Services. Only those vendors who are certified by the Illinois Department of Central Management Services as of the date of the bid opening will be considered in determining whether the vendor meets the participation goal.
(Include base bid below and each alternate on next page(s)): (Attach additional sheet if necessary)
**UI Project No: U15086**

**Bidder Name:** ___________________________ **Division of Work:** ___________________________

### BASE BID

<table>
<thead>
<tr>
<th>MBE/FBE/FMB Firm Name (ONLY include current and valid IL CMS Certified MBE/FBE/FMB firms)</th>
<th>Proposed Dollar Value of Contract/Subcontract</th>
<th>MBE/FBE/FMB Denotation (Must be certified with CMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>MBE FBE FMB</td>
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<td>2.</td>
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<td>10.</td>
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### ALTERNATE BID No.

<table>
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<tr>
<th>MBE/FBE/FMB Firm Name (ONLY include current and valid IL CMS Certified MBE/FBE/FMB firms)</th>
<th>Proposed Dollar Value of Subcontract</th>
<th>MBE/FBE/FMB Denotation (Must be certified with CMS)</th>
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### ALTERNATE BID No.

<table>
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<tr>
<th>MBE/FBE/FMB Firm Name (ONLY include current and valid IL CMS Certified MBE/FBE/FMB firms)</th>
<th>Proposed Dollar Value of Subcontract</th>
<th>MBE/FBE/FMB Denotation (Must be certified with CMS)</th>
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<td>MBE FBE FMB</td>
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</table>
Check the box if the specified MBE/FBE goal has not been met and Bidder is requesting a change from the specified goals or requesting a waiver of the specified goals.

When the MBE/FBE goal is not met, good faith effort documentation (if required per Document 00 40 00 Bid - Section 1.5.1) must be submitted within ten (10) calendar days after the bid opening.

The Bidder represents to Owner that, to the best of its knowledge and belief:

1. Each of the subcontractors and suppliers listed qualifies under the provisions and definitions of the Minority/Female Business Enterprise Program Act as either a minority/female owned business.

2. The subcontract(s) which will be executed by the Bidder for the first level subcontractors and suppliers if the Bidder is awarded this contract by Owner will meet or exceed the proposed dollar value indicated above and will comply with all provisions of the Minority/Female Business Enterprise Program Act.

3. Failure to submit a completed Owner bid form 00 40 00, including Attachment B – Minority/Female Business Enterprise Program Requirements will be considered a Material Deficiency and will result in rejection of bid.

4. Failure to use good faith efforts to achieve minority/female business enterprise participation goals when required in Document 00 40 00 Bid-Section 1.5.1 and to provide documentation of good faith efforts within ten (10) calendar days after bid opening shall be considered a Material Deficiency and will result in bid rejection.

Bidder agrees to the contractual requirements specified in Owner’s Contract Documents in regard to the Minority/Female Business Enterprise Program Act.

Bidder’s Firm Name: __________________________________________________________

Division of Work: __________________________________________________________

_________________________________________ Date

Signature, Title

SIGNATURE IS REQUIRED
THE BIDDING AND CONTRACT PROVISIONS

DOCUMENT 00 50 00 - STANDARD CONTRACT EXECUTION FORMS

(Standard Multiple Contract Set)

Note: The forms in this document section are included for reference only. Originals will be prepared for execution by the Owner and mailed to the contractor(s) with the Notice of Award.

1.0 EXECUTION OF THE AGREEMENT

1.1 Extraneous Markings. The Agreement shall be kept free from extraneous markings. If the Contractor desires to record the time/date for the receipt of the Agreement, the time/date stamp shall be affixed on a separate piece of paper clipped to the copy of the Agreement.

1.2 Contractor's Signatures. The Agreement shall be signed by the Owner and Contractor. The full name and business address of the Contractor shall be inserted and the Agreement shall be signed with authorized signature(s) described below. The name of the signing party or parties shall be typewritten or printed under all signatures to the Agreement.

1.3 Sole Proprietorships. If the Contractor is an individual, the trade name (if the Contractor is operating under a trade name) shall be indicated in the Agreement and the Agreement shall be signed by such individual. If signed by someone other than the individual, there shall be attached to the Agreement a duly authenticated power-of-attorney evidencing the signer's authority to execute such Agreement for and in behalf of the individual proprietor.

1.4 Partnerships. If the Contractor is operating as a partnership, each partner shall sign the Agreement. If the Agreement is not signed by each partner, there shall be attached to the Agreement a duly authorized power-of-attorney evidencing the signer's (signers') authority to sign such Agreement for and on behalf of the partnership.

1.5 Corporation. If the Contractor is a corporation, the following certification shall be executed and submitted on corporate letterhead:

"I, ___________________________________, certify that I am the ____________________________ (officer) of the corporation named as Contractor hereinabove; that ____________________________ (officer), who signed the foregoing Agreement on behalf of the Contractor was then ____________________________ (officer) of said Corporation; that said Agreement was duly signed for and in behalf of said Corporation by authority of its governing body, and is within the scope of its corporate powers."

If the Agreement is signed by the secretary of the corporation, the preceding certification shall be executed by some other officer of the corporation. In lieu of the foregoing certification, there may be attached to the Agreement copies of so much of the records of the corporation as will show the official character and authority of the officers signing, duly certified by the secretary or assistant secretary to be true copies.

If the Agreement is signed by someone other than one of the above-mentioned officers of the corporation, there shall be attached to the Agreement a duly authenticated power-of-attorney evidencing the signer's authority to sign the Agreement for and on behalf of the corporation.

2.0 EXECUTION OF THE PERFORMANCE BOND AND PAYMENT BOND

2.1 Execution by the Contractor. The Contractor, as principal, shall be named and shall execute the performance bond and payment bond in the same manner as required for the Agreement.

2.2 Execution by the Surety. The performance bond and payment bond shall be signed and sealed by an authorized representative of the surety, acting on behalf and in the name of such surety, with a duly authenticated power-of-attorney evidencing the signer's authority
to sign such bond for and on behalf of such surety attached thereto. Attorneys-in-fact who
sign the performance bond and payment bonds must file with each bond certified copies
of their powers-of-attorney. The power-of-attorney must be dated either before or on the
same date as the date of the bond, and the certificate that the power is in force and effect
must be dated the same as the date of the bond and be submitted on a full size sheet of
paper (8.5” x 11”). The seal must be legible upon conversion to electronic format.

3.0 EXECUTION OF THE CERTIFICATE OF INSURANCE

3.1 Forms and Copies. The certificate of insurance, including builder’s risk insurance,
(applicable only to Designated Contractor) shall be furnished in accordance with Articles
18 and 19 of the General Conditions on the ACORD form.

3.2 Required Statements. The certificate of insurance shall contain the following statements:

3.2.A Cancellation. The undersigned agent certifies that none of these policies will be
cancelled or changed so as to affect this certificate until thirty (30) days after
written notice of such cancellation or change has been delivered to the Owner by
certified or registered mail. The undersigned agent agrees to deliver copies of
the policies listed in this certificate to the Owner within ten (10) days following the
Owner’s request for such copies.

3.2.B Contract Requirements. The undersigned agent certifies that the insurance
coverages listed in this certificate include contractual coverages for the indemnity
Agreement, Contractor’s liability, and builder’s risk (applicable only to Designated
Contractor) to the minimum limits required by the Contract Documents for this
project (reference Articles 18 and 19 of the General Conditions). The
undersigned agent further certifies that the Owner and its assignees, if any, and
additional parties as designated by the Owner, if any, is named as an additional
insured on the general liability and builder’s risk (applicable only to Designated
Contractor) policies.

END OF INSTRUCTIONS
THIS AGREEMENT, made and entered into in the City of CITY, State of Illinois, as of the date of the last signature of the parties hereto, by and between NAME OF CONTRACTOR, ADDRESS OF CONTRACTOR, a (n) INDIVIDUAL, SOLE PROPRIETOR, CORPORATION, OR PARTNERSHIP, existing under the laws of the State of __________________________, hereinafter and in the Contract Documents referred to as the "Contractor" whose registered agent in Illinois is NAME OF AGENT, ADDRESS OF AGENT, and THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, a body corporate and politic of the State of Illinois, with its principal office in Urbana, Illinois, hereinafter and in the Contract Documents referred to as the "Owner", WITNESSETH: That, for the consideration hereinafter stated, the Contractor and the Owner agree as follows:

1.0 THE CONTRACT WORK

The Contractor shall furnish all of the labor, materials, fixtures, furnishings, equipment, transportation, construction, plant, and facilities required for and shall perform all Work on the Project and shall furnish and do everything required by the Contract Documents.

2.0 THE CONTRACT TIME

2.1 Starting Date. The Contractor shall commence the Work on the date specified in a written Notice to Proceed from the Owner.

2.2 Completion Date. Time is of the essence in this contract. The Contractor shall achieve Substantial Completion of the Work as expeditiously as the Work will permit, in such a manner as to cause no delay to any of the other contractors employed on the Project or to the completion of the Project as a whole and, subject to adjustments as provided by the Contract Documents, no later than __________ calendar days from the date specified in the Notice to Proceed (the "Substantial Completion Date").

The Contractor shall achieve Final Completion of the Project within thirty (30) days after Substantial Completion. Neither the Substantial Completion Date nor the time for Final Completion shall be changed except by Change Order issued in accordance with the terms of this contract.

2.3 Remedies. In the event Contractor fails to perform under this Agreement, including but not limited to failure to achieve Substantial Completion or Final Completion, or both, in the time and manner provided, Owner shall be afforded the right to pursue any and all remedies available at law and equity.

OR IF LIQUIDATED DAMAGES ALTERNATE IS ACCEPTED:

2.3 Liquidated Damages for Delay. If Contractor fails to achieve Substantial Completion or Final Completion, or both, as required by this contract, Contractor shall be liable to Owner for liquidated damages for unexcused delay as provided below:

A. For Delay in Substantial Completion. Contractor shall pay Owner the sum
of $___________ per day for every calendar day of unexcused delay in achieving Substantial Completion beyond the Substantial Completion Date. Any sums due and payable hereunder by Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by Owner, estimated at the time of executing this contract. When Owner reasonably believes that Substantial Completion will be inexcusably delayed, Owner shall be entitled, but not required, to withhold from any amounts otherwise due Contractor an amount then believed by Owner to be adequate to recover liquidated damages applicable to such delays. If and when Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which Owner has withheld payment, Owner shall promptly release to Contractor those funds withheld, but no longer applicable, as liquidated damages.

B. For Delay in Final Completion. If Contractor fails to achieve Final Completion within thirty (30) days after Substantial Completion, Contractor shall pay Owner the sum of $___________ per day for each and every calendar day of unexcused delay in achieving Final Completion. Any sums due and payable hereunder by Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by Owner, estimated at the time of executing this contract. When Owner reasonably believes that Final Completion will be inexcusably delayed, Owner shall be entitled, but not required, to withhold from any amounts otherwise due Contractor an amount then believed by Owner to be adequate to recover liquidated damages applicable to such delays. If and when Contractor overcomes the delay in achieving Final Completion for which Owner has withheld payment, Owner shall promptly release to Contractor those funds withheld, but no longer applicable, as liquidated damages.

3.0 THE CONTRACT SUM AND TERMS OF PAYMENT

3.1 The Contract Sum. The Owner shall pay to the Contractor or to Assigned Subcontractors on behalf of the Contractor, as applicable, subject to additions to and deductions from the Contract Sum, the total sum of AMOUNT IN WORDS 00/100 Dollars ($), which shall constitute the Contract Sum. The Contract Sum is based upon the following base bid and accepted alternate(s), if any, of Contractor and the Subcontract Sums of all Assigned Subcontractors which are described in Section 5.1 of this Agreement and are hereby accepted by the Owner:

(List Contractor Base Bid and Accepted Alternate(s) Here)

3.2 Payments. The Owner shall make payments for Work under the contract as provided in Articles 6 and 12 of the General Conditions.

3.3 Change Order Markups.

3.3.A Lump Sum and Time and Materials Changes. The following percentages for overhead and profit shall be added to, or, as applicable, deleted from, job costs for the net amount of Work added to or deleted from the contract by written lump sum or time and material Change Orders approved by the Owner in accordance with the General Conditions. Insurance, bond, and taxes are considered as job cost items and are not included in the percentages listed below. In any one quotation for added work involving a series of Subcontractors, including assigned subcontractors, the cumulative percentages for the Contractor’s and Subcontractor’s, including assigned subcontractors, overhead and profit shall not exceed twenty-five percent (25%). All costs shall be net costs including discounts realized by the contractor.
Add to the net extra job costs for added Work to be performed by:

1) Contractor’s own forces 15%
2) Subcontractors 5% (including Assigned Subcontractors).

Add to the net credit for job costs deleted for Work originally to have been performed by:

1) Contractor’s own forces 5%
2) Subcontractors 0% (including Assigned Subcontractors).

3.3.B Unit Price Changes. Unit price Change Orders shall be based on the unit prices identified in the Contractor's bid, which include the Contractor's overhead and profit for the Work performed on the unit price basis. The above-mentioned percentages shall not be applied to unit price changes.

4.0 THE CONTRACT DOCUMENTS

4.1 The contract between the parties consists of the “Contract Documents”. The Contract Documents include this Agreement, the General Conditions, the Construction Documents, any supplemental conditions, any special conditions, any subsequent Change Orders, field directives, and other written amendments to this Agreement, and all documents expressly annexed as part of this Agreement. Documents not described above are not Contract Documents and do not constitute part of the contract between the parties.

4.2 Addenda. The following addenda were issued prior to bid opening date and are hereby incorporated into this contract: ADDENDA NUMBER, dated DATE.

4.3 Order of Precedence. The order of precedence of the Contract Documents in the event of conflict shall be as defined in the General Conditions.

5.0 ASSIGNMENTS

5.1 Assignment of Contracts. The Owner hereby assigns, transfers, and sets over unto the Contractor, all of the Owner's rights, title, and interest in and to the following described contracts, to wit:

5.1.A KIND OF Contract: A contract entitled "Agreement" for construction of Division NUMBER - KIND OF Work for the NAME OF PROJECT in the total amount of AMOUNT IN WORDS 00/100 Dollars ($), made and entered into as of DATE, by and between the Owner and NAME OF SUBCONTRACTOR, whose address is ADDRESS OF SUBCONTRACTOR, hereinafter referred to as an "Assigned Subcontractor."

5.1.B KIND OF Contract: A contract entitled "Agreement" for construction of Division NUMBER - KIND OF Work for the NAME OF PROJECT in the total amount of AMOUNT IN WORDS 00/100 Dollars ($), made and entered into as of DATE, by and between the Owner and NAME OF SUBCONTRACTOR, whose address is ADDRESS OF SUBCONTRACTOR, hereinafter referred to as an "Assigned Subcontractor."

5.1.C KIND OF Contract: A contract entitled "Agreement" for construction of Division NUMBER - KIND OF Work for the NAME OF PROJECT in the total amount of AMOUNT IN WORDS 00/100 Dollars ($), made and entered into as of DATE, by and between the Owner and NAME OF SUBCONTRACTOR, whose address is ADDRESS OF SUBCONTRACTOR, hereinafter referred to as an "Assigned Subcontractor."

5.1.D KIND OF Contract: A contract entitled "Agreement" for construction of Division NUMBER - KIND OF Work for the NAME OF PROJECT in the total amount of

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The Owner further delegates to the Contractor all of the obligations and duties of the Owner to said Assigned Subcontractors subject to all the terms and conditions contained in the assigned contracts.

It is the intention of the parties that the foregoing assignment and delegation shall constitute a novation of the assigned contracts whereby the Contractor is substituted for the Owner as a party thereto.

5.2 **Acceptance of Assigned Contracts.** The Contractor hereby accepts the assignment and delegation of the hereinabove mentioned contracts, and each of them, upon the terms and conditions thereof and agrees that said Assigned Subcontractors, and each of them, shall be considered as and are the Contractor's Subcontractors to the same extent, for all purposes, and with the same legal effect as if the Contractor had originally bid for the Work under said assigned contracts and, upon the acceptance of such bid by the Owner and the execution of a contract between the Contractor and the Owner for the performance of all of said Work, the Contractor had entered directly into Subcontracts with the Assigned Subcontractors for the performance by them of the portions of the Work covered by their respective contracts with the Owner. The Contractor hereby irrevocably authorizes direct payment to be made by the Owner to each Assigned Subcontractor for the performance of the latter's Work under subcontract in accordance with the contract between the Contractor and the Owner for such Work. The Contractor and its surety shall be as fully responsible to the Owner for acts and omissions of the Assigned Subcontractors as they are for the acts and omissions of other Subcontractors and other persons directly employed by Contractor.

5.3 **Consideration for Assigned Contracts.** The Contractor has included an assignment fee in the Base Bid and agrees that this amount is adequate to compensate it for the assignment to it of the hereinabove mentioned contracts, its acceptance thereof, and the duties imposed upon it thereby.

5.4 **Other Assignments.** Except as provided above, this contract shall not be assigned to another contractor. Neither party to the contract shall assign the contract or sublet it as a whole without the written consent of the other. Any purported assignment without such written consent shall constitute a material breach hereof.

6.0 **PERFORMANCE BOND AND PAYMENT BOND**

The Contractor shall furnish the Owner a performance bond and a payment bond each in the penal sum of **AMOUNT IN WORDS 00/100 Dollars ($)** as required by and in accordance with the terms of the General Conditions. Each bond shall name Owner as Obligee.

7.0 **STATUTORY CERTIFICATIONS**

In accordance with applicable laws and subject to applicable penalties for false or misleading statements, the following certifications are made in connection with this Contract:

7.1 The Contractor certifies that ______________ is its Federal Taxpayer Identification Number and that it is doing business as a ______________.

7.2 The Contractor certifies that it has complied with the Substance Abuse Prevention on Public Works Projects Act (820 ILCS 265) including the requirement to file with Owner a written program that meets or exceeds the requirements of the Act. Submit a written program to the Owner only if the program has been revised since submitted with the annual prequalification. The requirements of this certification and disclosure are a material part of this Contract and the Contractor shall require this certification provision to be included in all Subcontracts.
8.0 CONSTITUTIONAL AND STATUTORY PROVISIONS

8.1 If this contract is funded from State of Illinois appropriated funds, the Contractor understands and agrees that this contract is subject to termination and cancellation without any penalty in any fiscal year in which the Illinois General Assembly fails to make an appropriation for payments under the terms of this contract. In the event of termination and cancellation for lack of appropriation, the Contractor shall be paid for services performed under this contract up to the effective date of the termination and cancellation.

8.2 Prevailing Wage.

Pursuant to the Prevailing Wage Act, Contractor shall pay a wage of no less than the general prevailing hourly rate as paid for work of a similar character in the locality in which the work is performed, to all laborers, workers and mechanics, pursuant to definitions, guidelines and procedures set forth in 820 ILCS 130/0.01 et seq. If the Illinois Department of Labor revises the prevailing rate of hourly wages to be paid by the Owner, the revised rate shall apply to this contract. The prevailing rate of hourly wages is revised by the Illinois Department of Labor and is available on the Illinois Department of Labor’s official website.

The Contractor shall submit monthly to Owner a certified copy of the records required under section 130/5(a)(1) of the Act. The certified payroll shall include records of all laborers, mechanics, and other workers employed by the Contractor, including assigned subcontractors, for services performed. The records shall include each worker’s name, address, telephone number when available, social security number, classification or classifications, hourly wages paid in each pay period, number of hours worked each day, and the starting and ending times of each work day. The certified payroll shall be accompanied by a statement signed by the Contractor and statements signed by each subcontractor where appropriate which aver that: (1) such records are true and accurate, (2) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required under the Act; and (3) the Contractor acknowledges that filing a certified payroll that he or she knows to be false is a Class B misdemeanor.

8.3 The documents and information for the contractors and subcontractors listed in Table 1 and as described below must be provided by the Owner to the Chief Procurement Officer for Higher Education.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Level</th>
<th>Contract</th>
<th>Dollar amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor without Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Contractor with Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Assigned Subcontractor</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Subcontractor</td>
<td>2</td>
<td>With Level 1</td>
<td>&gt; $50,000</td>
</tr>
<tr>
<td>Subcontractors'</td>
<td>3 and below</td>
<td>With Level 2 and below</td>
<td>&gt; $50,000</td>
</tr>
<tr>
<td>Subcontractor*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For any subcontractor beyond level 3 with a contract value of > $50,000 shall also be included.

**Level 1 Contractor**

The Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form submitted by the Level 1 Contractor with the bid documents are hereby made a part of this Contract.

It is the responsibility of the Level 1 Contractor to provide the following with respect to each Level subcontract* which exceeds $50,000. The forms shall be completed and signed by each Level subcontractor*.
The documents submitted to the Owner shall be in electronic pdf format and follow the Owner’s file naming convention. The forms and file naming convention can be found at: http://www.uocpres.uillinois.edu/contractors/contracts. These documents shall be provided to the Owner within 15 calendar days after the execution of the Contract or after execution of the subcontract, whichever is later.

The Level 1 Contractor must provide the above information for any Level subcontractors added or changed which results in a contract value exceeding $50K during the term of the contract.

Any subcontracts entered into prior to receiving a fully executed copy of the Contract are done at the Contractor and subcontracts own risk.

9.0 NOTICES

All notices shall be given by hand delivery to the Owner’s Representative, the Professional Services Consultant or the Contractor’s Project Manager, as applicable, or by delivery confirmation, to the following addressees:

To Owner:  

______________________________________________________________  

Attention:  

To Professional Service Consultant:  

______________________________________________________________  

To Contractor:  

______________________________________________________________  

Attention:  

All notices shall be effective upon receipt.

10.0 OWNER’S RIGHT TO MAKE GOOD CONTRACTOR’S DEFICIENCIES

If the Contractor should neglect to prosecute the Work or any part thereof diligently and properly or fail to properly perform any provision required by the Contract Documents, the Owner, after three days’ written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may, by Change Order, deduct the cost thereof from any payment then or thereafter due the Contractor.

11.0 OWNER’S WEB-BASED PROJECT MANAGEMENT SYSTEM (“PRZM”)

Contractor shall use the Owner’s web-based project management system (“PRZM”) to access and exchange project information with team members throughout the Project’s life. This includes providing electronic copies of subcontractor agreements and signed Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form for each subcontractor; processing payment applications, schedules, change requests/clarifications; and
other services as identified in this Agreement. Training on this system will be supplied by the Owner and is required to be taken by Contractor and Assigned Subcontractor representative.

12.0 COUNTERPARTS/FACSIMILE SIGNATURES

This Agreement may be signed in counterparts. Facsimile signatures constitute original signatures for all purposes.
IN WITNESS WHEREOF, the parties hereto have executed this Agreement as and of the day and year first hereinabove set forth.

CONTRACTOR:

NAME OF CONTRACTOR

By: ______________________________________ DATE

________________________________________
PRINT NAME

Title: ______________________________________

OWNER:

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

By: ______________________________________

Walter K. Knorr, Comptroller DATE
THIS AGREEMENT, made and entered into in the City of CITY, State of Illinois, as of the date of the last signature of the parties hereto, by and between NAME OF SUBCONTRACTOR, ADDRESS OF SUBCONTRACTOR, a (n) INDIVIDUAL, SOLE PROPRIETOR, CORPORATION, OR PARTNERSHIP, existing under the laws of the State of_________________________, hereinafter and in the Contract Documents referred to as the "Assigned Subcontractor" or "Subcontractor" whose registered agent in Illinois is NAME OF AGENT, ADDRESS OF AGENT and THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, a body corporate and politic of the State of Illinois, with its principal office in Urbana, Illinois, hereinafter and in the Contract Documents referred to as the "Owner",

WITNESSETH: That, for the consideration hereinafter stated, the Contractor and the Owner agree as follows:

1. **THE SUBCONTRACT WORK**

   The Subcontractor shall furnish all of the labor, materials, fixtures, furnishings, equipment, transportation, construction, plant, and facilities required for and shall perform all Contract Division NUMBER - KIND OF Work on the Project and shall furnish and do everything required by this Agreement and the other Contract Documents listed in paragraph 4 hereof.

2. **THE SUBCONTRACT TIME**

   2.1 **Starting Date.** The Subcontractor shall commence its Work under the contract on the date specified in a written Notice to Proceed.

   2.2 **Completion Date.** Time is of the essence in this contract. The Subcontractor shall achieve Substantial Completion of the Work as expeditiously as the Work will permit, in such a manner as to cause no delay to any of the other contractors employed on the Project or to the completion of the Project as a whole and, subject to adjustments as provided by the Contract Documents, no later than _________calendar days from the date specified in the Notice to Proceed (the “Substantial Completion Date”).

   The Contractor shall achieve Final Completion of the Project within thirty (30) days after Substantial Completion. Neither the Substantial Completion Date nor the time for Final Completion shall be changed except by Change Order issued in accordance with the terms of this contract.

3. **THE SUBCONTRACT SUM AND TERMS OF PAYMENT**

   3.1 **The Subcontract Sum.** The Owner shall pay the Subcontractor, subject to additions to and deductions from the Subcontract Sum, the sum of AMOUNT IN WORDS 00/100 Dollars which shall constitute the Subcontract Sum. The
Subcontract Sum is based upon the following base bid and accepted alternate(s), if any, of Subcontractor which are described in the Contract Documents and are hereby accepted by the Owner:

(List Subcontractor Base Bid and Accepted Alternate(s) Here)

3.2 Payments. The Owner shall make payments for work performed by the Subcontractor under the contract as provided in Articles 6 and 12 of the General Conditions.

3.3 Change Order Markups.

A. Lump Sum and Time and Materials Changes. The following percentages for overhead and profit shall be added to, or, as applicable, deleted from, job costs for the net amount of work added to or deleted from the contract by written lump sum or time and material change orders approved by the Owner in accordance with the General Conditions. Insurance, bond, and taxes are considered as job cost items and are not included in the percentages listed below. In any one quotation for added work involving a series of Subcontractors, including assigned subcontractors, the cumulative percentages for the Contractor's and Subcontractor's, including assigned subcontractors, overhead and profit shall not exceed twenty-five percent (25%). All costs shall be net costs including discounts realized by the contractor.

Add to the net extra job costs for added Work to be performed by:

1) Subcontractor’s own forces 15%
2) Subcontractors  5%

Add to the net credit for job costs deleted for Work originally to have been performed by:

1) Subcontractor’s own forces 5%
2) Subcontractors 0%

B. Unit Price Changes. All unit price Change Orders shall be based on the unit prices identified in the Subcontractor’s bid, which include the Subcontractor’s overhead and profit for the Work performed on the unit price basis. The above-mentioned percentages will not be applied to unit price changes.

4. THE CONTRACT DOCUMENTS

4.1 The contract between the parties consists of the “Contract Documents”. The Contract Documents include this Agreement, the General Conditions, the Construction Documents, any supplemental conditions, any special conditions, any subsequent Change Orders, field directives, and other written amendments to this Agreement, and all documents expressly annexed as part of this Agreement. Documents not described above are not Contract Documents and do not constitute part of the contract between the parties.

4.2 Addenda. The following addenda were issued prior to bid opening date and are hereby incorporated into this contract: ADDENDA NUMBER, dated DATE.
4.3 **Order of Precedence.** The order of precedence of the Contract Documents in the event of conflict shall be as defined in the General Conditions.

5. **ASSIGNMENTS**

5.1 **Assignment of Subcontractor’s Contract.** Upon execution of the Agreement between Owner and Contractor and execution of this Agreement between Owner and Assigned Subcontractor, the Owner has assigned, transferred, and set over all of the Owner's rights, title, and interest in and to this contract unto **NAME OF CONTRACTOR**, whose address is **ADDRESS OF CONTRACTOR**. The Owner has further delegated to said assignee all of the obligations and duties of the Owner to the Subcontractor under this contract, subject to all of the terms and conditions contained herein. Said assignee has, in the Agreement between Owner and Contractor, accepted said assignment and delegation.

5.2 **Consent to Assignment.** The Subcontractor hereby consents to the above-mentioned assignment and delegation and shall become an Assigned Subcontractor to said assignee and have the status set forth in Subparagraph 6.3.A of the General Conditions. It is the intention of the parties that said assignment and delegation shall constitute a novation of this contract whereby the said assignee is substituted for the Owner as a party hereto.

5.3 **Other Assignments.** No other assignments of this contract shall be made.

6. **PERFORMANCE BOND AND PAYMENT BOND**

The Subcontractor shall provide separate payment and performance bonds on the forms provided by the Owner and issued by a surety, or sureties, acceptable to the Owner. Each of the bonds shall include a penal sum in the amount of **AMOUNT IN WORDS 00/100 Dollars ($)** which amount shall be equal to one hundred percent (100%) of the Subcontract Sum. Subcontractor’s surety(ies) shall be deemed to have waived notice of, and to have consented to, changes to the Contract Documents, including changes in: (a) the time for performing the Work and payment of compensation to Subcontractor hereunder and (b) the Work to be performed. The Contract Documents shall be incorporated by reference into each of the bonds. Each bond shall name Owner as Obligee. However, upon assignment of this contract as set forth in Section 5 above, each bond shall be assigned to the assignee Contractor and the name of the assignee Contractor shall be deemed substituted as Obligee in lieu of the Owner on each bond.

7. **STATUTORY CERTIFICATIONS**

In accordance with applicable laws and subject to applicable penalties for false or misleading statements, the following certifications are made in connection with this Contract:

7.1 The Subcontractor certifies that ______________ is its Federal Taxpayer Identification Number and that it is doing business as a ______________.

7.2 The Subcontractor certifies that it has complied with the Substance Abuse Prevention on Public Works Projects Act (820 ILCS 265) including the requirement to file with Owner a written program that meets or exceeds the requirements of the Act. Submit a written program to the Owner only if the program has been revised since submitted with the annual prequalification. The requirements of this certification and disclosure are a material part of this Contract and the Subcontractor shall require this certification provision to be included in all subcontracts.
8. CONSTITUTIONAL AND STATUTORY PROVISIONS

8.1 If this contract is funded from State of Illinois appropriated funds, the Subcontractor understands and agrees that this contract is subject to termination and cancellation without any penalty in any fiscal year in which the Illinois General Assembly fails to make an appropriation for payments under the terms of this contract. In the event of termination and cancellation for lack of appropriation, the Subcontractor shall be paid for services performed under this contract up to the effective date of the termination and cancellation.

8.2 Prevailing Wage.
Pursuant to the Prevailing Wage Act, Subcontractor shall pay a wage of no less than the general prevailing hourly rate as paid for work of a similar character in the locality in which the work is performed, to all laborers, workers and mechanics, pursuant to definitions, guidelines and procedures set forth in 820 ILCS 130/0.01 et seq. If the Illinois Department of Labor revises the prevailing rate of hourly wages to be paid by the Owner, the revised rate shall apply to this contract. The prevailing rate of hourly wages is revised by the Illinois Department of Labor and is available on the Illinois Department of Labor’s official website.

The Subcontractor shall submit monthly to Owner a certified copy of the records required under section 130/5(a)(1) of the Act. The certified payroll shall include records of all laborers, mechanics, and other workers employed by the Subcontractor for services performed. The records shall include each worker’s name, address, telephone number when available, social security number, classification or classifications, hourly wages paid in each pay period, number of hours worked each day, and the starting and ending times of each work day. The certified payroll shall be accompanied by a statement signed by the Subcontractor and statements signed by each subcontractor where appropriate which aver that: (1) such records are true and accurate; (2) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required under the Act; and (3) the Subcontractor acknowledges that filing a certified payroll that he or she knows to be false is a Class B misdemeanor.

8.3 The documents and information for the contractors and subcontractors listed in Table 1 and as described below must be provided by the Owner to the Chief Procurement Officer for Higher Education.

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<tr>
<td>Contractor with Assigned</td>
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<tr>
<td>Assigned Subcontractor</td>
</tr>
<tr>
<td>Subcontractor</td>
</tr>
<tr>
<td>Subcontractors’ Subcontractor*</td>
</tr>
</tbody>
</table>

* For any subcontractor beyond level 3 with a contract value of > $50,000 shall also be included.

Level 1 Contractor
The Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form submitted by the Level 1 Assigned Subcontractor with the bid documents are hereby made a part of this Contract.

It is the responsibility of the Level 1 Assigned Subcontractor to provide the following
with respect to each Level subcontract* which exceeds $50,000. The forms shall be completed and signed by each Level subcontractor*.

- subcontractor(s) name(s)
- address(es)
- subcontract value(s)
- general type(s) of work to be performed
- Certifications and Statutory Requirements form(s)
- Financial Disclosures and Conflicts of Interest form(s),

The documents submitted to the Owner shall be in electronic pdf format and follow the Owner’s file naming convention. The forms and file naming convention can be found at: http://www.uocpres.uillinois.edu/contractors/contracts. These documents shall be provided to the Owner within 15 calendar days after the execution of the Contract or after execution of the subcontract, whichever is later.

The Level 1 Assigned Subcontractor must provide the above information for any Level subcontractors added or changed which results in a contract value exceeding $50K during the term of the contract.

Any subcontracts entered into prior to receiving a fully executed copy of the Contract are done at the Assigned Subcontractors own risk.

9. NOTICES

All notices shall be given by hand delivery to the Owner’s Representative, the assignee Contractor, the Professional Services Consultant or the Subcontractor’s Project Manager, as applicable, or by delivery confirmation, to the following addressees:

To Owner
______________________________
______________________________
Attention______________________

To Assignee Contractor
______________________________
______________________________
Attention______________________

To Professional Services Consultant:
______________________________
______________________________
Attention______________________

To Subcontractor
______________________________
______________________________
Attention______________________

All notices shall be effective upon receipt.

10. OWNER’S RIGHT TO MAKE GOOD SUBCONTRACTOR’S DEFICIENCIES

If the Subcontractor should neglect to prosecute the Work or any part thereof diligently and properly or fail to properly perform any provision required by the Contract Documents, the Owner, after three days’ written notice to the Subcontractor, may, without prejudice to any
other remedy it may have, make good such deficiencies and may deduct the cost thereof from any payment then or thereafter due the Subcontractor.

11. **OWNER’S WEB-BASED PROJECT MANAGEMENT SYSTEM (“PRZM”)**

Subcontractor shall use the Owner’s web-based project management system (“PRZM”) to access and exchange project information with team members throughout the Project’s life. This includes providing electronic copies of sub-subcontractor agreements and signed Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form for each sub-subcontractor; processing payment applications, schedules, change requests/clarifications; and other services as identified in this Agreement. Training on this system will be supplied by the Owner and is required to be taken by Subcontractor representative.

12. **COUNTERPARTS/FACSIMILE SIGNATURES**

This Agreement may be signed in counterparts. Facsimile signatures constitute original signatures for all purposes.
IN WITNESS WHEREOF, the parties hereto have executed this Agreement as and of the day and year first hereinabove set forth.

SUBCONTRACTOR

NAME OF SUBCONTRACTOR

By: ___________________________ DATE

________________________________________

PRINT NAME

Title: ___________________________

OWNER

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

By:

Walter K. Knorr, Comptroller DATE
AGREEMENT

PROJECT: TITLE

DIVISION: NUMBER - WORK
(No Assignment)

PROJECT No:

PROFESSIONAL SERVICES
CONSULTANT

CONTRACT SUM: $ AMOUNT

CAMPUS:

THIS AGREEMENT, made and entered into in the City of CITY, State of Illinois, as of the date of the last signature of the parties hereto, by and between NAME OF CONTRACTOR, ADDRESS OF CONTRACTOR, a(n) INDIVIDUAL, SOLE PROPRIETOR, CORPORATION, OR PARTNERSHIP, existing under the laws of the State of_________________________, hereinafter and in the Contract Documents referred to as the "Contractor" whose registered agent in Illinois is NAME OF AGENT, ADDRESS OF AGENT, and THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, a body corporate and politic of the State of Illinois, with its principal office in Urbana, Illinois, hereinafter and in the Contract Documents referred to as the "Owner",

WITNESSETH: That, for the consideration hereinafter stated, the Contractor and the Owner agree as follows:

1. THE CONTRACT WORK

   The Contractor shall furnish all of the labor, materials, fixtures, furnishings, equipment, transportation, construction, plant and facilities required for and shall perform all Contract Division NUMBER - KIND OF Work on the Project and shall furnish and do everything required by the Contract Documents.

2. THE CONTRACT TIME

   2.1 Starting Date. The Contractor shall commence the Work on the date specified in a written Notice to Proceed from the Owner.

   2.2 Completion Date. Time is of the essence in this contract. The Contractor shall achieve Substantial Completion of the Work as expeditiously as the Work will permit, in such a manner as to cause no delay to any of the other contractors employed on the Project or to the completion of the Project as a whole and, subject to adjustments as provided by the Contract Documents, no later than ____________ calendar days from the date specified in the Notice to Proceed (the “Substantial Completion Date”).

   The Contractor shall achieve Final Completion of the Work within thirty (30) days after Substantial Completion. Neither the Substantial Completion Date nor the time for Final Completion shall be changed except by Change Order issued in accordance with the terms of this contract.

   2.3 Remedies. In the event Contractor fails to perform under this Agreement, including but not limited to failure to achieve Substantial Completion or Final Completion, or both, in the time and manner provided, Owner shall be afforded the right to pursue any and all remedies available at law and equity.
OR IF LIQUIDATED DAMAGES ALTERNATE IS ACCEPTED:

2.3 Liquidated Damages for Delay. If Contractor fails to achieve Substantial Completion or Final Completion, or both, as required by this contract, Contractor shall be liable to Owner for liquidated damages for unexcused delay as provided below:

A. For Delay in Substantial Completion. Contractor shall pay Owner the sum of $ per day for every calendar day of unexcused delay in achieving Substantial Completion beyond the Substantial Completion Date. Any sums due and payable hereunder by Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by Owner, estimated at the time of executing this contract. When Owner reasonably believes that Substantial Completion will be inexcusably delayed, Owner shall be entitled, but not required, to withhold from any amounts otherwise due Contractor an amount then believed by Owner to be adequate to recover liquidated damages applicable to such delays. If and when Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which Owner has withheld payment, Owner shall promptly release to Contractor those funds withheld, but no longer applicable, as liquidated damages.

B. For Delay in Final Completion. If Contractor fails to achieve Final Completion within thirty (30) days after Substantial Completion, Contractor shall pay Owner the sum of $ per day for each and every calendar day of unexcused delay in achieving Final Completion. Any sums due and payable hereunder by Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by Owner, estimated at the time of executing this contract. When Owner reasonably believes that Final Completion will be inexcusably delayed, Owner shall be entitled, but not required, to withhold from any amounts otherwise due Contractor an amount then believed by Owner to be adequate to recover liquidated damages applicable to such delays. If and when Contractor overcomes the delay in achieving Final Completion for which Owner has withheld payment, Owner shall promptly release to Contractor those funds withheld, but no longer applicable, as liquidated damages.

3. THE CONTRACT SUM AND TERMS OF PAYMENT

3.1 The Contract Sum. The Owner shall pay to the Contractor, subject to additions to and deductions from the Contract Sum, the sum of AMOUNT IN WORDS 00/100 Dollars ($), which shall constitute the Contract Sum. The Contract Sum is based upon the following base bid and accepted alternate(s), if any, of Contractor which are described in the Contract Documents and are hereby accepted by the Owner:

(List Contractor Base Bid and Accepted Alternate(s) Here)

3.2 Payments. The Owner shall make payments for Work under the contract as provided in Article 12 of the General Conditions.

3.3 Change Order Markups.

A. Lump Sum and Time and Materials Changes. The following percentages for overhead and profit shall be added to or, as applicable, deleted from, job costs for the net amount of Work added to or deleted from the contract by written lump sum or time and material Change Orders approved by the
Owner in accordance with the General Conditions. Insurance, bond, and taxes are considered as job cost items and are not included in the percentages listed below. In any one quotation for added work involving a series of Subcontractors, the cumulative percentages for the Contractor’s and Subcontractor’s overhead and profit shall not exceed twenty-five percent (25%). All costs shall be net costs including discounts realized by the contractor.

Add to the net extra job costs for added Work to be performed by:
1) Contractor’s own forces 15%
2) Subcontractors 5%.

Add to the net credit for job costs deleted for Work originally to have been performed by:

1) Contractor’s own forces 5%
2) Subcontractors 0%.

B. Unit Price Changes. All unit price Change Orders shall be based on the unit prices identified in the Contractor's bid, which include the Contractor's overhead and profit for the Work performed on the unit price basis. The above-mentioned percentages shall not be applied to unit price changes.

4. THE CONTRACT DOCUMENTS

4.1 The contract between the parties consists of the "Contract Documents". The Contract Documents include this Agreement, the General Conditions, the Construction Documents, any supplemental conditions, any special conditions, any subsequent Change Orders, field directives, and other written amendments to this Agreement, and all documents expressly annexed as part of this Agreement. Documents not described above are not Contract Documents and do not constitute part of the contract between the parties.

4.2 Addenda. The following addenda were issued prior to bid opening date and are hereby incorporated into this contract: ADDENDA NUMBER, dated DATE.

4.3 Order of Precedence. The order of precedence of the Contract Documents in the event of conflict shall be as defined in the General Conditions.

5. ASSIGNMENTS

Neither party shall assign the contract or sublet it as a whole without the written consent of the other. Any purported assignment without such written consent shall constitute a material breach hereof.

6. PERFORMANCE BOND AND PAYMENT BOND

The Contractor shall furnish the Owner a performance bond and a payment bond each in the penal sum of AMOUNT IN WORDS 00/100 Dollars ($) as required by and in accordance with the terms of the General Conditions. Each bond shall name Owner as Obligee.

7. STATUTORY CERTIFICATIONS

In accordance with applicable laws and subject to applicable penalties for false or misleading statements, the following certifications are made in connection with this Contract:
7.1 The Contractor certifies that _______________ is its Federal Taxpayer Identification Number and that it is doing business as a ________________.

7.2 The Contractor certifies that it has complied with the Substance Abuse Prevention on Public Works Projects Act (820 ILCS 265) including the requirement to file with Owner a written program that meets or exceeds the requirements of the Act. Submit a written program to the Owner only if the program has been revised since submitted with the annual prequalification. The requirements of this certification and disclosure are a material part of this Contract and the Contractor shall require this certification provision to be included in all Subcontracts.

8. CONSTITUTIONAL AND STATUTORY PROVISIONS

8.1 If this contract is funded from State of Illinois appropriated funds, the Contractor understands and agrees that this contract is subject to termination and cancellation without any penalty in any fiscal year in which the Illinois General Assembly fails to make an appropriation for payments under the terms of this contract. In the event of termination and cancellation for lack of appropriation, the Contractor shall be paid for services performed under this contract up to the effective date of the termination and cancellation.

8.2 Prevailing Wage.
Pursuant to the Prevailing Wage Act, Contractor shall pay a wage of no less than the general prevailing hourly rate as paid for work of a similar character in the locality in which the work is performed, to all laborers, workers and mechanics, pursuant to definitions, guidelines and procedures set forth in 820 ILCS 130/0.01 et. seq. (2010). If the Illinois Department of Labor revises the prevailing rate of hourly wages to be paid by the Owner, the revised rate shall apply to this contract. The prevailing rate of hourly wages is revised by the Illinois Department of Labor and is available on the Illinois Department of Labor’s official website.

The Contractor shall submit monthly to Owner a certified copy of the records required under section 130/5(a)(1) of the Act. The certified payroll shall include records of all laborers, mechanics, and other workers employed by the Contractor, including assigned subcontractors, for services performed. The records shall include each worker’s name, address, telephone number when available, social security number, classification or classifications, hourly wages paid in each pay period, number of hours worked each day, and the starting and ending times of each work day. The certified payroll shall be accompanied by a statement signed by the Contractor and statements signed by each subcontractor where appropriate which aver that: (1) such records are true and accurate, (2) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required under the Act; and (3) the Contractor acknowledges that filing a certified payroll that he or she knows to be false is a Class B misdemeanor.

8.3 The documents and information for the contractors and subcontractors listed in Table 1 and as described below must be provided by the Owner to the Chief Procurement Officer for Higher Education.

Table 1: Contracts and Level Descriptions

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Level</th>
<th>Contract</th>
<th>Dollar amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor without Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Contractor with Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Assigned Subcontractor</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>------------------------</td>
<td>----</td>
<td>------------</td>
<td>-----</td>
</tr>
<tr>
<td>Subcontractor</td>
<td>2</td>
<td>With Level 1</td>
<td>&gt; $50,000</td>
</tr>
<tr>
<td>Subcontractors’</td>
<td>3</td>
<td>With Level 2 and below</td>
<td>&gt; $50,000</td>
</tr>
</tbody>
</table>

* For any subcontractor beyond level 3 with a contract value > $50,000 shall also be included.

**Level 1 Contractor**

The Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form submitted by the Level 1 Contractor with the bid documents are hereby made a part of this Contract.

It is the responsibility of the Level 1 Contractor to provide the following with respect to each Level subcontract* which exceeds $50,000. The forms shall be completed and signed by each Level subcontractor*.

* subcontractor(s) name(s)
* address(es)
* subcontract value(s)
* general type(s) of work to be performed
* Certifications and Statutory Requirements form(s)
* Financial Disclosures and Conflicts of Interest form(s),

The documents submitted to the Owner shall be in electronic pdf format and follow the Owner’s file naming convention. The forms and file naming convention can be found at: http://www.uocpres.uillinois.edu/contractors/contracts. These documents shall be provided to the Owner within 15 calendar days after the execution of the Contract or after execution of the subcontract, whichever is later.

The Level 1 Contractor must provide the above information for any Level subcontractors added or changed which results in a contract value exceeding $50K during the term of the contract.

Any subcontracts entered into prior to receiving a fully executed copy of the Contract are done at the Contractor and subcontractors own risk.

9. **NOTICES**

All notices shall be given by hand delivery to the Owner’s Representative, the Professional Services Consultant or the Contractor’s Project Manager, as applicable, or by delivery confirmation, to the following addressees:

To Owner: ________________________________
______________________________
Attention: __________________________

To Professional Services Consultant: ______________
______________________________
Attention: __________________________

To Contractor: ________________________________
______________________________
Attention: __________________________
All notices shall be effective upon receipt.

10. **OWNER’S RIGHT TO MAKE GOOD CONTRACTOR’S DEFICIENCIES**

If the Contractor should neglect to prosecute the Work or any part thereof diligently and properly or fail to properly perform any provision required by the Contract Documents, the Owner, after three days’ written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may, by Change Order, deduct the cost thereof from any payment then or thereafter due the Contractor, provided, however, that the Professional Services Consultant shall approve both such action and the amount charged to the Contractor.

11. **OWNER’S WEB-BASED PROJECT MANAGEMENT SYSTEM (“PRZM”)**

Contractor shall use the Owner’s web-based project management system (“PRZM”) to access and exchange project information with team members throughout the Project’s life. This includes providing electronic copies of subcontractor agreements and signed Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form for each subcontractor; processing payment applications, schedules, change requests/clarifications; and other services as identified in this Agreement. Training on this system will be supplied by the Owner and is required to be taken by Contractor representative.

12. **COUNTERPARTS/FACSIMILE SIGNATURES**

This Agreement may be signed in counterparts. Facsimile signatures constitute original signatures for all purposes.
IN WITNESS WHEREOF, the parties hereto have executed this Agreement as and of the day and year first hereinabove set forth.

CONTRACTOR:

NAME OF CONTRACTOR

By: ______________________________________ DATE

_______________________________________ PRINT NAME

Title: ______________________________________

OWNER:

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

By: ______________________________________ DATE

Walter K. Knorr, Comptroller
CONTRACTOR PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we (Insert Proper Name of Surety), a corporation organized and existing under the laws of the State of and duly authorized to do business in the State of Illinois, as surety (“Surety”), and (Insert Proper Name of Contractor), (Insert Address), a (Insert Form of Entity) organized and duly authorized to do business in the State of Illinois, as principal (“Contractor”), enter into, execute this bond (“Performance Bond”), and firmly bind ourselves unto THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, as Obligee (“Owner”), in the penal sum of (AMOUNT IN WORDS) $____________, as of the date of the last signature of the parties hereto.

WHEREAS, the Contractor has executed a contract with the Owner herewith (“Construction Contract”) for construction of (Insert Description and Location of the Construction Project) (“Project”); and,

WHEREAS, the Owner has required the Contractor to furnish this Performance Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

NOW THEREFORE, the Surety and the Contractor, both jointly and severally, and for themselves, their heirs, administrators, executors, successors, and assigns agree:

1. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it was copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied.

2. If Owner believes there is a possibility that Contractor will not fully perform, Owner reserves the right to contact Surety to notify Surety of potential default and seek preventative action from Surety. If Owner, by written notice to the Contractor and the Surety, declares the Contractor to be in default and terminates the right of the Contractor to proceed, the Surety shall, within 15 working days, proceed to take one, or at its option, more than one of the following courses of action:

   A. Complete full performance of the Construction Contract, by using a completing contractor jointly selected by the Surety and the Owner, including, without limitation, correction of defective and nonconforming work performed by or on behalf of the Contractor, pursuant to a written takeover agreement.

   B. During such performance by the Surety the Owner shall pay the Surety from its own funds only such sums as would have been due and payable to the Contractor under the Construction Contract as and when they would have been due and payable to the Contractor in the absence of the default and termination.

   C. Applicable law permitting, and with the prior written consent of the Owner, obtain bids or proposals from contractors previously identified as being acceptable to the Owner, for full performance of the Construction Contract. The Surety shall furnish the Owner a copy of such bids or proposals upon receipt of same. The Surety shall promptly select, with the agreement of the Owner, the best responsive bid or proposal and shall promptly tender the contractor submitting it, together with a contract for fulfillment and completion of the Construction Contract executed by the completing contractor, to the Owner for the Owner’s execution. Upon execution by the Owner of the contract for fulfillment and completion of the Construction Contract, the completing contractor shall furnish to the Owner a performance bond and a separate payment bond, each in the form of those bonds hereby furnished to the Owner for the Project by the Contractor. Each such bond shall be in the penal sum of the (1) fixed price for completion, (2) guaranteed maximum price for completion, or (3) estimated price for completion, whichever is applicable. The Owner shall pay the completing contractor from its own funds only such sums as would have been due and payable to the Contractor under the Construction Contract as and when they would have been due and payable to the
Contractor in the absence of the default and termination. To the extent that the Owner
is obligated to pay the completing contractor sums which would not have then been
due and payable to the Contractor under the Construction Contract, the Surety shall
provide the Owner with such sums in a sufficiently timely manner that the Owner can
utilize such sums in making timely payment to the completing contractor; or,

D. Take any and all other acts, if any, mutually agreed upon in writing by the Owner and
the Surety.

3. The Surety shall respond to the Notice within 15 working days of receipt indicating the course
of action it intends to take or advising that it requires more time to investigate the default and
selection a course of action. If the Surety requires more than 15 working days to investigate the
default and select a course of action or if the Surety elects to complete the work with a
completing contractor that is not prepared to commence performance within 15 working days
after receipt of Notice, and if Owner determines that it is in the best interest of Owner to
maintain progress of the work, the Owner may continue to work until the completing contractor
is prepared to commence performance. Unless otherwise agreed to by Owner, in no case may
the Surety take longer than 30 working days to advise Owner on the course of action it intends
to take. The Surety shall be liable for reasonable costs incurred by Owner to maintain the
progress to the extent the costs exceed the unpaid sums as would have been due and payable
to the Contractor under the Construction Contract in absence of the default and termination,
subject to the penal sum of the bond.

4. In addition to those duties set forth hereinabove, the Surety shall promptly pay the Owner all
loss, costs, and expenses resulting from the Contractor's default(s), including, without
limitation, fees, expenses, and costs for architects, engineers, consultants, testing, surveying
and attorneys, liquidated or actual damages, as applicable, for delay in completion of the
Project, and fees, expenses and costs incurred at the direction, request, or as a result of the
acts or omissions of the Surety.

5. In no event shall the Surety be obligated to the Owner hereunder for any sum in excess of the
Penal Sum.

6. The Surety waives notice of any changes to the Construction Contract including, without
limitation, changes in the contract time, the contract price, or the work to be performed.

7. This Performance Bond is provided by the Surety for the sole and exclusive benefit of the
Owner and, if applicable, any dual obligee designated by rider attached hereto, together with
their heirs, administrators, executors, successors or assigns. No other party, person or entity
shall have any rights against the Surety hereunder.
8. Any and all notices to the Surety, the Contractor or the Owner shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below:

SURETY:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

CONTRACTOR:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

C/O (Address of the University of Illinois construction unit responsible for the Project)

________________________________________________________________________

9. Any statutory limitation, which may be contractually superseded, to the contrary notwithstanding, any action hereon may be instituted so long as the applicable statute of limitations governing the Construction Contract has not run or expired.

CONTRACTOR:  

__________________________
(SIGNATURE OF AUTHORIZED SIGNATORY)

By: _________________________
(INSERT PROPER NAME OF CONTRACTOR)

SURETY:

__________________________
(SIGNATURE OF AUTHORIZED SIGNATORY)

By: _________________________
(INSERT PROPER NAME OF SURETY)

Seal

(OFFICE OR TITLE OF PERSON SIGNING)  

(office or title of person signing)

ORIGINAL POWER OF ATTORNEY MUST BE ATTACHED.
CONTRACTOR PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we (Insert Proper Name of Surety), a corporation organized and existing under the laws of the State of and duly authorized to do business in the State of Illinois, as surety ("Surety"), and (Insert Proper Name of Contractor), (Insert Address), a (Insert Form of Entity) organized, and duly authorized to do business in the State of Illinois, as principal ("Contractor"), enter into, execute this bond ("Payment Bond"), and firmly bind ourselves unto THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, as Obligee ("Owner"), in the penal sum of (AMOUNT IN WORDS) $____________, as of the date of the last signature of the parties hereto.

WHEREAS, the Contractor has executed a contract with the Owner herewith ("Construction Contract") for construction of (Insert Description and Location of the Construction Project) ("Project"); and,

WHEREAS, the Owner has required the Contractor to furnish this Payment Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

NOW THEREFORE, the Surety and the Contractor, both jointly and severally, and for themselves, their heirs, administrators, executors, successors and assigns agree:

1. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it was copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied, and, without limitation, specifically including Contractor's obligation to pay for labor, materials, services and equipment provided in connection with performance of the Construction Contract;

2. For purposes of this Payment Bond, Beneficiary is defined as a person or entity who has actually provided labor, material, equipment, services or other items for use in furtherance of the Construction Contract, and having:
   A. a direct contract with the Contractor; or
   B. a direct contract with a subcontractor of the Contractor; or
   C. rights, under the laws of the State of Illinois, to file a lien, a claim or notice of lien, or otherwise make a claim against the Project or against funds held by the Owner, if the Project or such funds is, or were, subject to such filing.

3. The Surety shall not be obligated hereunder to a Beneficiary other than a Beneficiary having a direct contract with the Contractor unless such Beneficiary has given written notice of its claim to the Contractor and the Surety within the longer of:
   A. ninety (90) days after such Beneficiary provided labor, material, equipment, services or other items for use in furtherance of the Construction Contract; or,
   B. the period of time provided by the State of Illinois for (1) filing of a lien, claim of lien, notice of lien, if the Project is, or were, subject to such filing, or (2) otherwise making a claim against the Project or against funds held by the Owner stating the amount claimed and identifying, by name and address, the person or entity to whom such labor, material, equipment, services or other items were provided.

4. In no event shall the Surety be obligated hereunder for sums in excess of the Penal Sum.

5. Upon receipt of a claim from a Beneficiary hereunder, the Surety shall promptly, and in no event later than 15 days after receipt of such claim, respond to such claim in writing (furnishing a copy of such response to the Owner) by:
A. making payment of all sums not in dispute; and
B. stating the basis for disputing any sums not paid.

6. No action shall be commenced by a Beneficiary hereunder after the passage of the longer of one (1) year following final completion of the Construction Contract or, if this bond is provided in compliance with the law of the State of Illinois, any limitation period provided therein. If the limitation period contained in this Paragraph is unenforceable, it shall be deemed amended to provide the minimum period for an action against the Surety on a payment bond by a third-party beneficiary thereof.

7. Any and all notices to the Surety or the Contractor shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below:

SURETY:

___________________________________________________________
___________________________________________________________
___________________________________________________________

CONTRACTOR:

___________________________________________________________
___________________________________________________________
___________________________________________________________

THE BOARD OF TRUSTEES
OF THE UNIVERSITY OF ILLINOIS

C/O (Address of the University of Illinois construction unit responsible for the Project)

___________________________________________________________

CONTRACTOR:  SURETY:

___________________________________________________________
___________________________________________________________

(INSERT PROPER NAME OF CONSTRUCTOR)  (INSERT PROPER NAME OF SURETY)

By:  By:

(SIGNATURE OF AUTHORIZED SIGNATORY)  (SIGNATURE OF AUTHORIZED SIGNATORY)

(OFFICE OR TITLE OF PERSON SIGNING)  (OFFICE OR TITLE OF PERSON SIGNING)

Seal

ORIGINAL POWER OF ATTORNEY MUST BE ATTACHED.
ASSIGNED SUBCONTRACTOR PERFORMANCE AND PAYMENT BONDS

ASSIGNED SUBCONTRACTOR PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we (Insert Proper Name of Surety), a corporation organized and existing under the laws of the State of __________________________, and duly authorized to do business in the State of Illinois, as surety (“Surety”); and (Insert Proper Name of Subcontractor) (Insert Address), a (Insert Form of Entity) organized and duly authorized to do business in the State of Illinois, as principal (“Subcontractor”), enter into, execute this bond (“Performance Bond”), and firmly bind ourselves unto THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS (“Owner”), as Obligee, in the penal sum of (AMOUNT IN WORDS) $___________________________, as of the date of the last signature of the parties hereto.

WHEREAS, the Subcontractor has executed a contract with the Owner herewith (“Construction Contract”) for construction of (Insert Description and Location of the Construction Project) (“Project”); and,

WHEREAS, the Owner has required the Subcontractor to furnish this Performance Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Subcontractor;

WHEREAS, upon the Subcontractor’s execution of said Construction Contract with the Owner, the Owner has assigned its rights and delegated its duties therein to ____________________ (“Contractor”), the Contractor has accepted said assignment of rights and delegation of duties, the Subcontractor and the Surety have agreed to said assignment of rights and delegation of duties, and the Subcontractor and the Surety each intend that said assignment of rights and delegation of duties constitute a novation whereby the Contractor is substituted for the Owner as a party to the Construction Contract; and,

WHEREAS, the Subcontractor and the Surety, with the Owner’s consent, each intend that the Contractor be substituted for the Owner as the Obligee hereon;

NOW THEREFORE, the Surety and the Subcontractor, both jointly and severally, and for themselves, their heirs, administrators, executors, successors, and assigns agree:

1. The foregoing recitals are hereby incorporated herein and by reference made a part hereof to the same extent and effect as though they were copied verbatim in this Paragraph 1.

2. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it was copied verbatim herein. The Surety and the Subcontractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied, and, without limitation, specifically including Subcontractor's obligation to pay for labor, materials, services and equipment provided in connection with performance of the Construction Contract;

3. The Contractor is hereby substituted for the Owner as the Obligee herein.

4. If the Subcontractor is in default of the Construction Contract and the Obligee by written notice to the Subcontractor and the Surety, declares the Subcontractor to be in default and terminates the right of the Subcontractor to proceed, the Surety shall, within 15 working days, proceed to take one, or at its option, more than one of the following courses of action:

A. Complete full performance of the Construction Contract, by using a completing subcontractor jointly selected by the Surety and Owner, including, without limitation, correction of defective and nonconforming work performed by or on behalf of the Subcontractor, pursuant to a written takeover agreement;

B. During such performance by the Surety the Obligee shall pay the Surety from its own funds only such sums as would have been due and payable to the Subcontractor under the Construction Contract as and when they would have been due and payable to the Subcontractor in the absence of the default and termination.

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Form approved by Legal Counsel - UOCP&RES 11/15
C. Applicable law permitting, and with the prior written consent of the Obligee, obtain bids or proposals from contractors previously identified as being acceptable to the Obligee, for full performance of the Construction Contract. The Surety shall furnish the Obligee a copy of such bids or proposals upon receipt of same. The Surety shall promptly select, with the agreement of the Obligee, the best responsive bid or proposal and shall promptly tender the contractor submitting it, together with a contract for fulfillment and completion of the Construction Contract executed by the completing contractor, to the Obligee for the Obligee's execution. Upon execution by the Obligee of the contract for fulfillment and completion of the Construction Contract, the completing contractor shall furnish to the Obligee a performance bond and a separate payment bond, each in a form acceptable to the Obligee. Each such bond shall be in the penal sum of the (1) fixed price for completion, (2) guaranteed maximum price for completion, or (3) estimated price for completion, whichever is applicable. The Obligee shall pay the completing contractor from its own funds only such sums as would have been due and payable to the Subcontractor under the Construction Contract as and when they would have been due and payable to the Subcontractor in the absence of the default and termination. To the extent that the Obligee is obligated to pay the completing contractor sums which would not have then been due and payable to the Subcontractor under the Construction Contract, the Surety shall provide the Obligee with such sums in a sufficiently timely manner that the Obligee can utilize such sums in making timely payment to the completing contractor; or,

D. Take any and all other acts, if any, mutually agreed upon in writing by the Obligee and the Surety.

5. The Surety shall respond to the Notice within 15 working days of receipt indicating the course of action it intends to take or advising that it requires more time to investigate the default and selection a course of action. If the Surety requires more than 15 working days to investigate the default and select a course of action or if the Surety elects to complete the work with a completing contractor that is not prepared to commence performance within 15 working days after receipt of Notice, and if Owner determines that it is in the best interest of Owner to maintain progress of the work, the Owner may continue to work until the completing subcontractor is prepared to commence performance. Unless otherwise agreed to by Owner, in no case may the Surety take longer than 30 working days to advise Owner on the course of action it intends to take. The Surety shall be liable for reasonable costs incurred by Owner to maintain the progress to the extent the costs exceed the unpaid sums as would have been due and payable to the Contractor under the Construction Contract in absence of the default and termination, subject to the penal sum of the bond.

6. In addition to those duties set forth hereinabove, the Surety shall promptly pay the Obligee all loss, costs, and expenses resulting from the Subcontractor's default(s), including, without limitation, fees, expenses, and costs for architects, engineers, consultants, testing, surveying and attorneys, liquidated or actual damages, as applicable, for delay in completion of the Project, and fees, expenses and costs incurred at the direction, request, or as a result of the acts or omissions of the Surety.

7. In no event shall the Surety be obligated to the Obligee hereunder for any sum in excess of the Penal Sum.

8. The Surety waives notice of any changes to the Construction Contract including, without limitation, changes in the contract time, the contract price, or the work to be performed.

9. This Performance Bond is provided by the Surety for the sole and exclusive benefit of the Obligee and, if applicable, any additional obligee designated by rider attached hereto, together
with their heirs, administrators, executors, successors or assigns. No other party, person or entity shall have any rights against the Surety hereunder.

10. Any and all notices to the Surety, the Subcontractor, the Contractor or the Owner shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below:

SURETY:
___________________________________________________________
___________________________________________________________
___________________________________________________________

SUBCONTRACTOR:
___________________________________________________________
___________________________________________________________
___________________________________________________________

CONTRACTOR:
___________________________________________________________
___________________________________________________________
___________________________________________________________

THE BOARD OF TRUSTEES OF
THE UNIVERSITY OF ILLINOIS
C/O (Address of the University of Illinois construction unit responsible for the Project)
___________________________________________________________
___________________________________________________________

11. Any statutory limitation, which may be contractually superseded, to the contrary notwithstanding, any action hereon may be instituted so long as the applicable statute of limitations governing the Construction Contract has not run or expired.

SUBCONTRACTOR: SURETY:

By: (INSERT PROPER NAME OF SUBCONTRACTOR) By: (INSERT PROPER NAME OF SURETY)
(SIGNATURE OF AUTHORIZED SIGNATORY) (SIGNATURE OF AUTHORIZED SIGNATORY)

(office or title of person signing) (office or title of person signing)

ORIGINAL POWER OF ATTORNEY MUST BE ATTACHED.
The Owner hereby consents to the substitution of the Contractor in lieu of the Owner as Obligee on the foregoing Assigned Subcontractor Performance Bond.

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

By:__________________________________________

Walter K. Knorr, Comptroller DATE
ASSIGNED SUBCONTRACTOR PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we (Insert Proper Name of Surety), a corporation organized and existing under the laws of the State of ___________ and duly authorized to do business in the State of Illinois, as surety (“Surety”), and (Insert Proper Name of Subcontractor) (Insert Address), a (Insert Form of Entity) organized and duly authorized to do business in the State of Illinois, as principal (“Subcontractor”), enter into, execute this bond (“Performance Bond”), and firmly bind ourselves unto THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS (“Owner”), as Obligee, in the penal sum of (AMOUNT IN WORDS) $___________________________, as of the date of the last signature of the parties hereto.

WHEREAS, the Subcontractor has executed a contract with the Owner herewith (“Construction Contract”) for construction of (Insert Description and Location of the Construction Project) (“Project”); and,

WHEREAS, the Owner has required the Subcontractor to furnish this Payment Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Subcontractor;

WHEREAS, upon the Subcontractor’s execution of said Construction Contract with the Owner, the Owner has assigned its rights and delegated its duties therein to ____________________ (“Contractor”), the Contractor has accepted said assignment of rights and delegation of duties, the Subcontractor and the Surety have agreed to said assignment of rights and delegation of duties, and the Subcontractor and the Surety each intend that said assignment of rights and delegation of duties constitute a novation whereby the Contractor is substituted for the Owner as a party to the Construction Contract; and,

WHEREAS, the Subcontractor and the Surety, with the Owner’s consent, each intend that the Contractor be substituted for the Owner as the Obligee hereon;

NOW THEREFORE, the Surety and the Subcontractor, both jointly and severally, and for themselves, their heirs, administrators, executors, successors, and assigns agree:

1. The foregoing recitals are hereby incorporated herein and by reference made a part hereof to the same extent and effect as though they were copied verbatim in this Paragraph 1.

2. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it was copied verbatim herein. The Surety and the Subcontractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied, and, without limitation, specifically including Subcontractor’s obligation to pay for labor, materials, services and equipment provided in connection with performance of the Construction Contract;

3. The Contractor is hereby substituted for the Owner as the Obligee herein.

4. For purposes of this Payment Bond, Beneficiary is defined as a person or entity who has actually provided labor, material, equipment, services or other items for use in furtherance of the Construction Contract, and having:

   A. a direct contract with the Subcontractor; or

   B. a direct contract with a subcontractor of the Subcontractor; or

   C. rights, under the laws of the State of Illinois, to file a lien, a claim or notice of lien, or otherwise make a claim against the Project or against funds held by the Owner or the Contractor, if the Project or such funds is, or were, subject to such filing.

5. The Surety shall not be obligated hereunder to a Beneficiary other than a Beneficiary having a direct contract with the Subcontractor unless such Beneficiary has given written notice of its claim to the Subcontractor and the Surety within the longer of:
A. ninety (90) days after such Beneficiary provided labor, material, equipment, services or other items for use in furtherance of the Construction Contract; or,

B. the period of time provided by the State of Illinois for (1) filing of a lien, claim of lien, notice of lien, if the Project is, or were, subject to such filing, or (2) otherwise making a claim against the Project or against funds held by the Owner or the Contractor, stating the amount claimed and identifying, by name and address, the person or entity to whom such labor, material, equipment, services or other items were provided.

6. In no event shall the Surety be obligated hereunder for sums in excess of the Penal Sum.

7. Upon receipt of a claim from a Beneficiary hereunder, the Surety shall promptly, and in no event later than 15 days after receipt of such claim, respond to such claim in writing (furnishing a copy of such response to the Contractor and the Owner) by:

A. making payment of all sums not in dispute; and,

B. stating the basis for disputing any sums not paid.

8. No action shall be commenced by a Beneficiary hereunder after the passage of the longer of one (1) year following final completion of the Construction Contract or, if this bond is provided in compliance with the law of the State of Illinois, any limitation period provided therein. If the limitation period contained in this Paragraph is unenforceable, it shall be deemed amended to provide the minimum period for an action against the Surety on a payment bond by a third-party beneficiary thereof.

9. Any and all notices to the Surety, the Subcontractor, the Contractor or the Owner shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below:

SURETY:
___________________________________________________________
___________________________________________________________

SUBCONTRACTOR:
___________________________________________________________
___________________________________________________________

CONTRACTOR:
___________________________________________________________
___________________________________________________________

THE BOARD OF TRUSTEES OF
THE UNIVERSITY OF ILLINOIS
C/O (Address of the University of Illinois construction unit responsible for the Project)
___________________________________________________________
___________________________________________________________

SUBCONTRACTOR: SURETY: Seal
 ORIGINAL POWER OF ATTORNEY MUST BE ATTACHED.

The Owner hereby consents to the substitution of the Contractor in lieu of the Owner as Obligee on the foregoing Assigned Subcontractor Payment Bond.

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS

By: __________________________________________
    Walter K. Knorr, Comptroller    DATE
NOTICE OF INTENT TO AWARD CONTRACT

Subject to review and approval by the Board of Trustees of the University of Illinois and the Procurement Policy Board of the State of Illinois, the University of Illinois intends to award to your firm a contract for the above-referenced division of work on the project identified herein. Please promptly execute and return to the Board of Trustees of the University of Illinois the attached documents indicated below:

1. **AGREEMENT.** Please execute the documents in accordance with the attached instructions and return all copies to the University for signature. One fully executed copy will be returned to you for your files.

2. **PERFORMANCE BOND AND PAYMENT BOND.** The contract amount is stated thereon. Please have your bonding company execute the bonds in accordance with the attached instructions and return all executed copies to the University for approval. One approved copy will be returned to you for your files.

3. **CERTIFICATE OF INSURANCE.** The Certificate of Insurance submittal requirements shall be in accordance with Article 18 of the General Conditions. The Evidence of Property for builder’s risk insurance policy submittal requirements applicable to only the designated party identified on Document 00 10 00 – Notice to Bidders, Paragraph 2.8 shall be in accordance with Article 19 of the General Conditions. Please name The Board of Trustees of the University of Illinois and OTHER DESIGNATED PARTIES TO BE NOTED HERE as additional insured in the appropriate locations.

4. **SUBSTANCE ABUSE PREVENTION PROGRAM.** Prior to commencement of Work, Contractor shall submit to Owner a written Program that meets or exceeds the requirements of the Substance Abuse Prevention on Public Works Projects Act (820 ILCS 265). Submit a written program to the Owner only if the program has been revised since submitted with the annual prequalification.

5. **ATTACHMENT A – MBE/FBE SUBCONTRACTOR/SUPPLIER CERTIFICATION.** A copy of Attachment A is enclosed. Please submit a completed and signed Attachment A for each of the IL CMS certified MBE/FBE subcontractor(s) and/or supplier(s) being utilized to meet the designated participation goals as previously specified on Attachment B that was submitted with your bid proposal to the University for this project. Each form must be signed by the MBE/FBE subcontractor or supplier and must be submitted with your executed contract.

6. **REQUEST FOR ELECTRONIC PAYMENT:** Upon processing of the required form, authorized payments from the University would be made directly to your company's designated bank account, without the production of a paper check. The University is prepared to offer payment terms of 'Net 20', in exchange for your enrollment in ACH/direct deposit. Under this offer, the University shall make every effort possible to deliver payment within 20 days after receipt of a complete and proper invoice. If you are interested in enrolling in our program, please review the instructions with the “Request for Electronic Payment” form, complete the form and submit it according to the instructions. The “Request for Electronic Payment” form along with ‘Terms & Conditions’ and ‘Instructions’ are attached.

All of the above documents are to be returned as a set to Project Manager, (address of the University of Illinois construction unit responsible for the project), as soon as possible but no later than fifteen (15) days after receipt of this notice. Upon official approval by the Board of Trustees of the University of Illinois and the Procurement Policy Board of the State of Illinois, and upon the satisfactory execution and approval of these documents, your firm will be issued written notice of award and notice to proceed. Your bid deposit will be released and you may commence work as specified in the Contract Documents. Please note that the University of Illinois does not have authorization for, nor will it permit, the expenditure of funds prior to approval by the Board of Trustees of the University of Illinois and the Procurement Policy Board of the State of Illinois.

All vendors are required to comply with applicable provisions of the Illinois Procurement Code (30 ILCS 500/1 et seq.). Bidder shall provide all required forms completed by subcontractor(s) as required in 00 50 00 – Standard Contract Execution Forms, Article 8 Constitutional and Statutory Provisions. Electronic copies of the required forms and the file naming convention are available online at: http://www.uocpres.uillinois.edu/contractors/contracts.

The awarded low, responsive and responsible Bidder will be required to register with the Owner’s Vendor Services Application, and will be required to ensure that all Bidders’ subcontractors, vendors, and suppliers to be included on its Schedule of Values as identified in document 00 70 00 ‘General Conditions’ are also registered in the Owner’s Vendor Services Application. The vendor registration module of the Vendor Services Application can be accessed at: https://appserv6.admin.uillinois.edu/VendorRegistration/open/VendorSearch.jsp

A preconstruction conference will be scheduled shortly and you will be notified of its date, time, and location.

I appreciate your cooperation and timely response to this notice and look forward to a pleasant working relationship with your firm on this project.

Sincerely,
UNIVERSITY OF ILLINOIS
Notice of Intent to Award Contract and Notice of Award of Contract
Attachment A: MBE/FBE Subcontractor/Supplier Certification

Section 1: To be completed by Prime Contractor

Project No.: _____________________________________________
Project Name: __________________________________________

Contractor: ____________________________________________
FTIN Number: __________________________________________
Official Address: _________________________________________

Area Code/Telephone No: _________________________________

Subcontract/Supplier for: _________________________________
Subcontractor’s/Supplier’s Name: __________________________
FTIN Number: ____________________ Area Code/Telephone Number: ____________________
Official Address (Street): __________________________________
(City, State, Zip Code): ___________________________________

Section 2: To be completed and signed by each MBE/FBE Subcontractor and/or Supplier.

I. Subcontractor/Supplier certifies that the proposed subcontract will be in the amount of
   $______________________ for ________________________________ work.

II. Subcontractor/Supplier certifies that the business is certified with CMS and is:
A. ( ) Minority owned: (check one)
   ( ) Black/African American                 ( ) Hispanic                 ( ) Asian American
   ( ) Native American/Alaskan Native
B. ( ) Female Owned
   as defined in Section 2 of the Minority and Female Business Enterprise Act, as amended (30 ILCS 575) (See definitions)

III. Subcontractor/Supplier certifies that the information included herein is true and correct, and that the subcontractor agrees, if Contractor is awarded the Project, to enter into the indicated subcontract. Subcontractor/Supplier agrees to immediately notify Owner of all changes to this Certification.

IV. A true copy of the signed subcontract or supply agreement shall be delivered to Owner in accordance with Document 00 20 00 and Owner shall be given complete and accurate information from time to time regarding the actual work performed on the project and the payments under the subcontract.

NOTE: IT IS A CRIME UNDER THE LAWS OF THE STATE OF ILLINOIS TO OBTAIN A STATE CONTRACT BY MAKING FALSE STATEMENTS OR MISREPRESENTATIONS TO A STATE AGENCY.

Respectfully submitted and signed this_____________ day of__________________________.

ATTEST: By: __________________________________________________________
Signature: ____________________________________________________________ "Signature Required"
Title: ______________________________________________________________

Subcontractor/Supplier Firm Name: __________________________________________
DEFINITIONS:

A. **Minority Person.** Minority person is a citizen or lawful permanent resident of the United States and who is:
   1. Black/African American (a person having origins in any of the black racial groups in Africa);
   2. Hispanic (a person of Spanish or Portuguese culture with origins in Mexico, Central or South America, or the Caribbean Islands, regardless of race);
   3. Asian American (a person having origins in any of the original peoples of the Far East, southeastern Asia, the Indian Subcontinent or the Pacific Islands); or
   4. Native American/Alaskan Native (a person having origins in any of the original peoples of North America).

B. **Female.** Female is a person who is a citizen or a lawful permanent resident of the United States and who is of the female gender.

C. **Minority owned business.** Minority owned business is a business concern which is at least 51 percent owned by one or more minority persons, or, in the case of a corporation, at least 51 percent of the stock in which is owned by one or more minority individuals; and the management and daily business operations of which are controlled by one or more of the minority individuals who own it.

D. **Female owned business.** Female owned business is a business concern which is at least 51 percent owned by one or more females, or, in the case of a corporation, at least 51 percent of the stock in which is owned by one or more females; and the management and daily business operations of which are controlled by one or more of the females who own it.
University of Illinois
REQUEST FOR ELECTRONIC PAYMENT

Company Name: ________________________________________________________

Address: ______________________________________________________________

City / State / Zip: ________________________________________________________

Contact/phone/email: ____________________________________________________

Company FEIN Number: __________________________________________________

Will any portion of any payment be directed to a foreign bank account? Yes_______ No_______

If you do not currently plan to send funds to a foreign bank but will in the future, you must notify
University Payables.

We hereby authorize the University of Illinois to initiate credit entries to the following corporate account at the
depository financial institution named below, hereafter called DEPOSITORY, and to credit the same to such
account. We acknowledge that the origination of ACH transactions to our account must comply with U.S. law and
additionally we agree to be bound by the NACHA Operating Rules for all entries initiated to said account.

Furthermore, in the event that an erroneous credit is initiated to the below described account, we hereby provide
authorization to the University of Illinois to initiate a debit in the amount of the erroneous credit entry.

This authorization is to remain in full force and effect until the University of Illinois has received written
notification from the undersigned of its termination in such time and in such manner as to afford the
University and DEPOSITORY a reasonable opportunity to act on it.

By my signature below, I attest that I have read the Terms and Conditions for Electronic Payment on the back of
this form and agree to abide by such terms and that I have the authority to bind my Company in such terms.

Signature of Company CFO _______________________________ Date ________________

Printed name of Company CFO _______________________________ Title ________________

(to be completed by Financial Institution/Depository)

Depository Name: ________________________________________________________

Depository Contact Name/Phone: _______________________________ / ________________

City/State/Zip: _______________________________ / ________________

Depository Contact Signature: ____________________________________________

ABA/Routing Transit Number: ________________________________
(9 digits including the check digit)

Account Holder Name: ________________________________________________
(Name exactly as it appears on the account at the DEPOSITORY)

Account Number: _______________________________ Account Type: _________
(For the account holder at said DEPOSITORY) (checking or savings)

(Please see page 2)
REQUEST FOR ELECTRONIC PAYMENT

Terms & Conditions

* ACH transactions are governed by the operating rules of the National Automated Clearinghouse Association.
* This authorization is to remain in full force and effect until the University of Illinois has received written notification from the Company of its termination in such time and in such manner as to afford the University and DEPOSITORY a reasonable opportunity to act on it.
* This authorization provides for the University to initiate debit entries to correct erroneous credit entries that may occur.
* **ALL** payments made by the University through University Payables to the Company will be made via ACH and deposited to the single designated vendor account. No provisions are currently available to route specific payments (originated from specific campuses or departments) to different company bank accounts. **Once a company authorization is in place, all payments to that company (regardless of the source or nature of the payment) will be delivered to the designated bank account.**
* Payments will be made in their entirety to the single designated company account. No provision exists for splitting payments and directing them to multiple accounts.
* **ALL** payments made by the University through University Payables to the Company will be subject to various banking holidays that may or may not coincide with holidays observed by the University and/or the company.
* In no circumstance is the University responsible for any banking fees assessed by the company’s financial institution.
* Due to the nature of direct deposit, it is not possible to attach contracts, remittance documents or other materials to payments. Companies must be prepared to accept such documents via separate mailings.
* Inquiries from the vendor regarding individual payments should be directed to University Payables Customer Service staff at 217-333-6583, or via email at: “obfsupay@uillinois.edu”.
* All existing University procedures and policies regarding procurement, invoice processing, approval, payment and audit will remain in effect.

Instructions

* Company CFO should review this entire document and complete box #1 of page #1
* Original document should then be routed to the EFT Coordinator of the company’s financial institution (depository)
* Box #2, page #1 should then be completed by the financial institution/depository’s EFT Coordinator
* Then, the original completed document should be mailed to:

  University Payables  
  ATTN: Vendor Maintenance Group  
  Illini Plaza Building Suite 210 MC-660  
  1817 South Neil Street  
  Champaign, IL 61820

* Enrollment or procedural questions may be directed to the address above, or via phone at: 217/333-6583

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<th>For University Internal Use Only:</th>
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<tr>
<td>Date Received: __________ Date Contacted: __________ By: __________________________</td>
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<tr>
<td>Approved by: ____________________</td>
</tr>
<tr>
<td>Processed By: __________ Date Processed: __________ Company Banner ID: __________</td>
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</tbody>
</table>
NOTICE OF AWARD OF CONTRACT

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS, and the Procurement Policy Board of the State of Illinois have approved the award of your firm's contract for the above-referenced division of work on this project. This award is subject to your promptly executing and returning to THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS the attached documents indicated below:

1. **AGREEMENT.** Please execute the documents in accordance with the attached instructions and return all copies to the University for signature. One fully executed copy will be returned to you for your files.

2. **PERFORMANCE BOND AND PAYMENT BOND.** The contract amount is stated thereon. Please have your bonding company execute the bonds in accordance with the attached instructions and return all executed copies to the University for approval. One approved copy will be returned to you for your files.

3. **CERTIFICATE OF INSURANCE.** The Certificate of Insurance submittal requirements shall be in accordance with Article 18 of the General Conditions. The Evidence of Property for builder's risk insurance policy submittal requirements applicable to only the designated party identified on Document 00 10 00 – Notice to Bidders, Paragraph 2.8, should be in accordance with Article 19 of the General Conditions. Please name The Board of Trustees of the University of Illinois, and its assignees, if any, and OTHER DESIGNATED PARTIES TO BE NOTED HERE as additional insureds in the appropriate locations.

4. **SUBSTANCE ABUSE PREVENTION PROGRAM.** Prior to commencement of Work, Contractor shall submit to Owner a written Program that meets or exceeds the requirements of the Substance Abuse Prevention on Public Works Projects Act (820 ILCS 265). Submit a written program to the Owner only if the program has been revised since submitted with the annual prequalification.

5. **ATTACHMENT A – MBE/FBE SUBCONTRACTOR/SUPPLIER CERTIFICATION.** A copy of Attachment A is enclosed. Please submit a completed and signed Attachment A for each of the IL CMS certified MBE/FBE subcontractor(s) and/or supplier(s) being utilized to meet the designated participation goals as previously specified on Attachment B that was submitted with your bid proposal to the University for this project. Each form must be signed by the MBE/FBE subcontractor or supplier and must be submitted with your executed contract.

6. **Request for Electronic Payment:** Upon processing of the required form, authorized payments from the University would be made directly to your company's designated bank account, without the production of a paper check. The University is prepared to offer payment terms of 'Net 20', in exchange for your enrollment in ACH/direct deposit. Under this offer, the University shall make every effort possible to deliver payment within 20 days after receipt of a complete and approved invoice. If you are interested in enrolling in our program, please review the instructions with the "Request for Electronic Payment" form, complete the form and submit it according to the instructions. The "Request for Electronic Payment" form along with 'Terms & Conditions' and 'Instructions' are attached.

All of the above documents are to be returned as a set to Project Manager, (address of the University of Illinois construction unit responsible for the project), as soon as possible but no later than fifteen (15) days after receipt of this notice. Upon satisfactory execution and approval of these documents, your firm will be issued a written notice to proceed; your bid deposit will be released; and you can commence work as specified in the Contract Documents.

All vendors are required to comply with applicable provisions of the Illinois Procurement Code (30 ILCS 500/1 et seq.). Bidder shall provide all required forms completed by subcontractor(s) as required in 00 50 00 – Standard Contract Execution Forms, Article 8 Constitutional and Statutory Provisions. Electronic copies of the required forms and the file naming convention are available online at: http://www.uocpres.uillinois.edu/contractors/contracts

The awarded low, responsive and responsible Bidder will be required to register with the Owner’s Vendor Services Application, and will be required to ensure that all Bidders’ subcontractors, vendors, and suppliers to be included on its Schedule of Values as identified in document 00 70 00 ‘General Conditions’ are also registered in the Owner’s Vendor Services Application. The vendor registration module of the Vendor Services Application can be accessed at: https://appser6.admin.uillinois.edu/VendorRegistration/open/VendorSearch.jsp

A preconstruction conference will be scheduled shortly and you will be notified of its date, time, and location.

I appreciate your cooperation and timely response to this notice and look forward to a pleasant working relationship with your firm on this project.

Sincerely,

Project Manager
UNIVERSITY OF ILLINOIS
Notice of Intent to Award Contract and Notice of Award of Contract
Attachment A: MBE/FBE Subcontractor/Supplier Certification

Section 1: To be completed by Prime Contractor

Project No.: _____________________________
Project Name: ____________________________

Contractor: _________________________________________________________
FTIN Number: _______________________________________________________
Official Address: _____________________________________________________
Area Code/Telephone No: _____________________________________________

Subcontract/Supplier for: _____________________________________________
Subcontractor’s/Supplier’s Name: _______________________________________
FTIN Number: ____________________ Area Code/Telephone Number: ________
Official Address (Street): _____________________________________________
(City, State, Zip Code): ______________________________________________

Section 2: To be completed and signed by each MBE/FBE Subcontractor and/or Supplier.

I. Subcontractor/Supplier certifies that the proposed subcontract will be in the amount of
$____________________ for ______________________________ work.

II. Subcontractor/Supplier certifies that the business is certified with CMS and is:
A. ( ) Minority owned: (check one)
   ( ) Black/African American ( ) Hispanic ( ) Asian American
   ( ) Native American/Alaskan Native
B. ( ) Female Owned

as defined in Section 2 of the Minority and Female Business Enterprise Act, as amended (30 ILCS 575) (See definitions)

III. Subcontractor/Supplier certifies that the information included herein is true and correct, and that the
subcontractor agrees, if Contractor is awarded the Project, to enter into the indicated subcontract.
Subcontractor/Supplier agrees to immediately notify Owner of all changes to this Certification.

IV. A true copy of the signed subcontract or supply agreement shall be delivered to Owner in
accordance with Document 00 20 00 and Owner shall be given complete and accurate information
from time to time regarding the actual work performed on the project and the payments under the
subcontract.

NOTE: IT IS A CRIME UNDER THE LAWS OF THE STATE OF ILLINOIS TO OBTAIN A STATE CONTRACT BY
MAKING FALSE STATEMENTS OR MISREPRESENTATIONS TO A STATE AGENCY.

Respectfully submitted and signed this____________ day of__________________________.

ATTEST:
By: ______________________________________________________________
   Signature:________________________________________________________ “Signature Required”
   Title: ____________________________________________________________

Subcontractor/Supplier Firm Name: ________________________________________

83 of 167
Form approved by Legal Counsel - UOCP&RES 11/15
DEFINITIONS:

A. **Minority Person.** Minority person is a citizen or lawful permanent resident of the United States and who is:
   1. Black/African American (a person having origins in any of the black racial groups in Africa);
   2. Hispanic (a person of Spanish or Portuguese culture with origins in Mexico, Central or South America, or the Caribbean Islands, regardless of race);
   3. Asian American (a person having origins in any of the original peoples of the Far East, southeastern Asia, the Indian Subcontinent or the Pacific Islands); or
   4. Native American/Alaskan Native (a person having origins in any of the original peoples of North America).

B. **Female.** Female is a person who is a citizen or a lawful permanent resident of the United States and who is of the female gender.

C. **Minority owned business.** Minority owned business is a business concern which is at least 51 percent owned by one or more minority persons, or, in the case of a corporation, at least 51 percent of the stock in which is owned by one or more minority individuals; and the management and daily business operations of which are controlled by one or more of the minority individuals who own it.

D. **Female owned business.** Female owned business is a business concern which is at least 51 percent owned by one or more females, or, in the case of a corporation, at least 51 percent of the stock in which is owned by one or more females; and the management and daily business operations of which are controlled by one or more of the females who own it.
# University of Illinois
## REQUEST FOR ELECTRONIC PAYMENT

### (to be completed by Company)

<table>
<thead>
<tr>
<th>Company Name:</th>
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<table>
<thead>
<tr>
<th>Address:</th>
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<table>
<thead>
<tr>
<th>City / State / Zip:</th>
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<table>
<thead>
<tr>
<th>Contact/phone/email:</th>
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</thead>
<tbody>
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<td></td>
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<table>
<thead>
<tr>
<th>Company FEIN Number:</th>
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</table>

Will any portion of any payment be directed to a foreign bank account? **Yes**_______ **No**_______

If you do not currently plan to send funds to a foreign bank but will in the future, you must notify University Payables.

We hereby authorize the University of Illinois to initiate credit entries to the following corporate account at the depository financial institution named below, hereafter called DEPOSITORY, and to credit the same to such account. We acknowledge that the origination of ACH transactions to our account must comply with U.S. law and additionally we agree to be bound by the NACHA Operating Rules for all entries initiated to said account.

Furthermore, in the event that an erroneous credit is initiated to the below described account, we hereby provide authorization to the University of Illinois to initiate a debit in the amount of the erroneous credit entry.

This authorization is to remain in full force and effect until the University of Illinois has received written notification from the undersigned of its termination in such time and in such manner as to afford the University and DEPOSITORY a reasonable opportunity to act on it.

By my signature below, I attest that I have read the Terms and Conditions for Electronic Payment on the back of this form and agree to abide by such terms and that I have the authority to bind my Company in such terms.

<table>
<thead>
<tr>
<th>Signature of Company CFO</th>
<th>Date</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Printed name of Company CFO</th>
<th>Title</th>
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<tbody>
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</tbody>
</table>

### (to be completed by Financial Institution/Depository)

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<tr>
<th>Depository Name:</th>
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<tr>
<th>Depository Contact Name/Phone:</th>
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<th>City/State/Zip:</th>
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<tr>
<th>Depository Contact Signature:</th>
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<thead>
<tr>
<th>ABA/Routing Transit Number:</th>
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<tr>
<td>(9 digits including the check digit)</td>
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<table>
<thead>
<tr>
<th>Account Holder Name:</th>
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<table>
<thead>
<tr>
<th>Account Number:</th>
<th>Account Type:</th>
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<tbody>
<tr>
<td></td>
<td>(checking or savings)</td>
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</table>

(Please see page 2)
University of Illinois
REQUEST FOR ELECTRONIC PAYMENT

Terms & Conditions

* ACH transactions are governed by the operating rules of the National Automated Clearinghouse Association.
* This authorization is to remain in full force and effect until the University of Illinois has received written notification from the Company of its termination in such time and in such manner as to afford the University and DEPOSITORY a reasonable opportunity to act on it.
* This authorization provides for the University to initiate debit entries to correct erroneous credit entries that may occur.
* ALL payments made by the University through University Payables to the Company will be made via ACH and deposited to the single designated vendor account. No provisions are currently available to route specific payments (originated from specific campuses or departments) to different company bank accounts. Once a company authorization is in place, all payments to that company (regardless of the source or nature of the payment) will be delivered to the designated bank account.
* Payments will be made in their entirety to the single designated company account. No provision exists for splitting payments and directing them to multiple accounts.
* ALL payments made by the University through University Payables to the Company will be subject to various banking holidays that may or may not coincide with holidays observed by the University and/or the company.
* In no circumstance is the University responsible for any banking fees assessed by the company’s financial institution.
* Due to the nature of direct deposit, it is not possible to attach contracts, remittance documents or other materials to payments. Companies must be prepared to accept such documents via separate mailings.
* Inquiries from the vendor regarding individual payments should be directed to University Payables Customer Service staff at 217-333-6583, or via email at: “obfsupay@uillinois.edu”.
* All existing University procedures and policies regarding procurement, invoice processing, approval, payment and audit will remain in effect.

Instructions

* Company CFO should review this entire document and complete box #1 of page #1
* Original document should then be routed to the EFT Coordinator of the company’s financial institution (depository)
* Box #2, page #1 should then be completed by the financial institution/depository’s EFT Coordinator
* Then, the original completed document should be mailed to:

University Payables
ATTN: Vendor Maintenance Group
Illini Plaza Building Suite 210 MC-660
1817 South Neil Street
Champaign, IL 61820

* Enrollment or procedural questions may be directed to the address above, or via phone at: 217/333-6583

For University Internal Use Only:

Date Received: __________ Date Contacted: __________ By: ________________________

Approved by: _____________________________

Processed By: _______________ Date Processed: __________ Company Banner ID: __________
To: Contractor  
Address:  
Project:  
Division:  

Date:  
Contract Amount:  
Project Number:  
List contractor and all assigned subcontractor divisions of work here

NOTICE OF AWARD OF CONTRACT/NOTICE TO PROCEED CONSTRUCTION

The BOARD of TRUSTEES of the UNIVERSITY OF ILLINOIS on DATE notified your firm of its intent to award a contract to your firm for the above referenced division of work on this project.

The BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS and the Procurement Policy Board of the State of Illinois have approved the award of your firm’s contract. We have received and executed all required documentation (Agreement, Payment Bond, Performance Bond, required Liability and Builders Risk Insurance, and Substance Abuse Prevention Program) to proceed with awarding you the above contract.

Pursuant to the terms of the Contract Documents, you are hereby notified to commence work at the start of business on DATE. Please provide a copy of this Notice to each contractor that has been assigned to you as evidence of approval to proceed.

The Substantial Completion Date set forth in the Contract Documents is ## calendar days from the start date shown above, and has been calculated to be DATE.

The Preconstruction Conference has been scheduled for DATE at TIME at the LOCATION. A representative from your firm should be present at this meeting. OR The Preconstruction Conference will be scheduled in the near future. Date, time and location will be forthcoming. A representative from your firm should be present at this meeting.

All vendors are required to comply with applicable provisions of the Illinois Procurement Code (30 ILCS 500/1 et seq.). Bidder shall provide all required forms completed by subcontractor(s) as required in 00 50 00 – Standard Contract Execution Forms, Article 8 Constitutional and Statutory Provisions. Electronic copies of the required forms and the file naming convention are available online at: http://www.uocpres.uillinois.edu/contractors/contracts

The awarded low, responsive and responsible Bidder will be required to register with the Owner’s Vendor Services Application, and will be required to ensure that all Bidders’ subcontractors, vendors, and suppliers to be included on its Schedule of Values as identified in document 00 70 00 ‘General Conditions’ are also registered in the Owner’s Vendor Services Application. The vendor registration module of the Vendor Services Application can be accessed at: https://appserv6.admin.uillinois.edu/VendorRegistration/open/VendorSearch.jsp

I am the Owner’s Representative and am authorized to administer your contract for and in the name of The Board of Trustees of the University of Illinois. A copy of the signed and executed Agreement for this project is enclosed. OR A copy of the signed and executed Agreement for this project will be sent under separate cover.

I appreciate your cooperation in responding to this notice and am looking forward to a pleasant working relationship with your firm on this project.

Sincerely,

OWNER'S REPRESENTATIVE NAME

PM/Sec
(Enclosure)

Copies:
NOTICE TO PROCEED

We have received and executed all required documentation (Agreement, Payment Bond, Performance Bond, required Liability and Builders Risk Insurance, and Substance Abuse Prevention Program) to proceed with awarding you the above contract. Pursuant to the terms of the above-referenced contract, you are hereby notified to commence work at the start of business on DATE. Please provide a copy of this Notice to each contractor that has been assigned to you as evidence of approval to proceed.

The Preconstruction Conference has been scheduled for DATE at TIME at the LOCATION. A representative from your firm should be present at this meeting. OR

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I appreciate your cooperation in responding to this notice and am looking forward to a pleasant working relationship with your firm on this project.

Sincerely,

OWNER'S REPRESENTATIVE NAME

PM/Sec
(Enclosure)
Copies:

END OF DOCUMENT 00 50 00
THE BIDDING AND CONTRACT PROVISIONS

DOCUMENT 00 60 00 - STANDARD CONTRACT ADMINISTRATION FORMS

(Standard Multiple Contract Sets)

Note: The forms in this document section are included for reference only. Forms are to be prepared by the Contractor or Professional Services Consultant, as applicable, and submitted at the appropriate time.
<table>
<thead>
<tr>
<th>Line No.</th>
<th>CSI Sectn</th>
<th>Payment Item</th>
<th>Assigned Subcontractor/ Subcontractor/ Supplier/Vendor (where applicable)</th>
<th>MBE/FBE* Status</th>
<th>Est Qty</th>
<th>Material &amp; Equipment</th>
<th>Installation (Labor, Eq, etc)</th>
<th>Total</th>
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<td>Bonds and Insurance</td>
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<td>Overhead and Profit</td>
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<td>7</td>
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<td>AS #1 CONTRACT DIVISION (for Contractor only)</td>
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<td></td>
<td>AS #2 CONTRACT DIVISION (for Contractor only)</td>
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<td>AS #3 CONTRACT DIVISION (for Contractor only)</td>
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<td>10</td>
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<td>AS #4 CONTRACT DIVISION (for Contractor only)</td>
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<tr>
<td>11</td>
<td></td>
<td>AS #5 CONTRACT DIVISION (for Contractor only)</td>
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</tr>
</tbody>
</table>

Subtotal Forward (if applicable): $ $ $

Total Contract Price $ $ $

---

**ASSIGNED SUBCONTRACTOR’S CERTIFICATION**

Assigned Subcontractor: ____________________

By: ____________________

Date: ____________________

---

**CONTRACTOR’S CERTIFICATION**

Contractor: ____________________

By: ____________________

Date: ____________________

---

**PROFESSIONAL SERVICES CONSULTANT APPROVAL**

PSC: ____________________

By: ____________________

Date: ____________________

---

**OWNER APPROVAL**

Owner: Board of Trustees of the University of Illinois

By: ____________________

Date: ____________________

* Indicate if subcontractor is a MBE or FBE otherwise leave blank. Attach MBE/FBE certification form for all MBE/FBE subcontractors/vendors/suppliers identified herein.

** PSC and Owner’s approvals only required for Contractor’s Schedule of Values since Assigned Subcontractor’s Schedule of Values are inclusive.
**PAYMENT APPLICATION: PART I - PAYMENT CERTIFICATE**

**for** (mark appropriate box)

( ) CONTRACTOR w/ ASSIGNED SUBCONTRACTOR(S)

( ) ASSIGNED SUBCONTRACTOR

**PROJECT NAME:**

**APPLICANT NAME & ADDRESS:**

**City:**

**State:**

**Zip:**

**CONTRACT DIVISION:**

**VENDOR REFERENCE:**

**ENCUMBRANCE #**

**APPLICATION #:**

**PAY PERIOD:**

**BANNER VENDOR NUMBER:**

### 1.0 CONTRACTOR’S TOTAL CONSTRUCTION CONTRACT SUM AND ALL CHANGE ORDERS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Contractor’s Total Construction Contract Sum and All Change Orders</td>
<td>$_________</td>
</tr>
</tbody>
</table>

### 2.0 CURRENT CONTRACT/AGREEMENT AMOUNT

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Applicant’s Accepted Base Bid and Alternates</td>
<td>$_________</td>
</tr>
<tr>
<td>2.2 Authorized Change Orders for Applicant’s Added Work</td>
<td>+ $_________</td>
</tr>
<tr>
<td>2.3 Authorized Change Orders for Applicant’s Deleted Work</td>
<td>- $_________</td>
</tr>
<tr>
<td>2.4 TOTAL (2.1 through 2.3)</td>
<td>$_________</td>
</tr>
</tbody>
</table>

### 3.0 CURRENT PAYMENT DUE

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Total Value of Applicant’s Work Completed to Date</td>
<td>$_________</td>
</tr>
<tr>
<td>3.2 Less % retained (round to nearest dollar)</td>
<td>- $_________</td>
</tr>
<tr>
<td>3.3 Less Payments Previously Certified</td>
<td>- $_________</td>
</tr>
<tr>
<td>3.4 Current Payment Due to Applicant</td>
<td>$_________</td>
</tr>
</tbody>
</table>

### 4.0 CERTIFICATIONS & APPROVALS

#### 4.1 Assigned Subcontractor’s Certification

I certify that the work covered by this application for payment has been completed to the point indicated herein, that the completed work is in accordance with the contract documents, and that the current payment identified above is now due. I further certify that, immediately upon receipt of the above payment, all Subcontractors, if any, will be promptly paid.

By: ___________________________ Date: __________

Authorized Representative

#### 4.2 Contractor’s Approval

Contractor

I agree that the Assigned Subcontractor’s progress and performance to date on this project is satisfactory and approve payment of the certified amount. IF CONTRACTOR’S PAY APPLICATION: I also certify that the work covered by this application for payment has been completed to the point indicated herein, that the completed work is in accordance with the contract documents, and that the current payment identified above is now due. I further certify that, immediately upon receipt of the above payment, all Subcontractors, if any, will be promptly paid.

By: ___________________________ Date: __________

Authorized Representative

#### 4.3 Professional Services Consultant’s Certification

PSC: ___________________________

Based on the contract documents, my own observations of the progress of the work and the data comprising the above application, I certify to the Owner that the work has progressed to the point indicated, that the quality of the work appears to be in accordance with the contract documents, and that the Applicant is entitled to payment of the amount certified by him as being currently due.

By: ___________________________ Date: __________

Authorized Representative (Place “N/A” on line if not applicable)

#### 4.4 Owner’s Representative’s Approval

University of Illinois-construction unit responsible for the named project

I approve payment of the amount certified above.

By: ___________________________ Date: __________

Authorized Representative (Place “N/A” on line if not applicable)

---

**CFOAPAL (required fields)**

<table>
<thead>
<tr>
<th>Chart</th>
<th>Fund</th>
<th>Organization</th>
<th>Account</th>
<th>Program</th>
<th>Activity</th>
<th>Location</th>
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</table>

**AUTHORIZED DEPARTMENT APPROVAL FOR OBFS**

Chairperson, Board of Trustees

Distribution: University of Illinois construction unit responsible for the named project: Professional Services Consultant: Contractor: Applicant
University of Illinois

CONTRACTOR’S/ASSIGNED SUBCONTRACTOR’S PAYMENT APPLICATION – PART II
SCHEDULE OF WORK: OVERALL SUMMARY & MBE/FBE SUMMARY BY SUBCONTRACTOR

Project: __________________________________________ Contractor/Assigned

Contract Division: ________________________________

Contractor/Assigned Subcontractor: __________________________________________

Pay Period: ____________________ to ____________________

Contract Value: ____________________ Application #: ____________________

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description of Work Assigned Subcontractor/</th>
<th>MBE/ FBE</th>
<th>Scheduled Value</th>
<th>% Cplt (H/D)</th>
<th>Work Completed: Previously Approved Applications</th>
<th>Work Completed: Due This Period</th>
<th>Total Completed and Stored (F+G)</th>
<th>Balance to Complete (D-H)</th>
<th>Total of: (H / Total of Contract)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Description of Work</td>
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<td>Assigned Subcontractor/</td>
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<td>Due This Period</td>
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<td>AS#2</td>
<td>CONTRACT DIVISION</td>
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<td>AS#3</td>
<td>CONTRACT DIVISION</td>
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<td>CONTRACT DIVISION</td>
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AFFIDAVIT

STATE OF ILLINOIS

COUNTY OF_______________________________________

The Affiant,_______________________________________________________________, being first duly
sworn, upon the oath deposes and says the following:

1. **Identification:** The Affiant states that the Affiant is _______________________ of
   _________________________________, hereinafter termed "the Contractor", who is the
   Contractor for the__________________________________________ project, hereinafter termed "the
   Project", constructed for The Board of Trustees of the University of Illinois, hereinafter called
   "the Owner", under a written agreement dated __________________ entered into by and
   between the Contractor and the Owner, and pertaining to said Work on the Project.

2. **Receipt of Previous Payments and Partial Waiver of Lien:** The Affiant further states that the
   Contractor has received payments to date from the Owner totaling ____________________________________
   Dollars ($________________), which includes the sum certified under the Contractor’s previous partial
   payment request, and that the Contractor hereby waives all right to a mechanic’s lien on the
   funds and property of the Owner to the extent to which payment has been made. The
   Contractor, however, reserves all right to a lien against the property or funds of the Owner for
   such work, labor, or material that is yet to be performed or furnished under the above contract
   and for any amount or amounts which may yet be due and owing to the Contractor, including
   retainage held by the Owner. Previously certified payments, if any, that have not been received
   by the Contractor are stated below:

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________
3. **Payments for Work Over $1,000 in Value:** The Affiant further states that the following persons or firms in accordance with Articles 6 and 12 of the General Conditions have been contracted with, have done or are doing labor, have furnished or are furnishing materials, or have performed or are performing services on the project of a total value of more than ONE THOUSAND DOLLARS ($1,000.00):

<table>
<thead>
<tr>
<th>Name of Subcontractor/Vendor /Supplier</th>
<th>Subcontract Work, Materials, or Equipment Provided</th>
<th>Current Value of Purchase Order Or Subcontract</th>
<th>*Total Paid to Date</th>
<th>*Unpaid Amount Previously Requested (incl. retainage)</th>
<th>*Pending Balance</th>
</tr>
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</table>

**Notes:** Pursuant to Articles 6 and 12 of the General Conditions:

1. For all Contractor payment requests except the final, the actual distributions made (or not made) to subcontractors/vendors/suppliers should correspond to amounts requested in the Contractor's previous payment requests.
2. For the Contractor's final payment request, all subcontractors/vendors/suppliers should be paid in full.
3. Provide detailed explanations in section 4 of this form for all payments due to subcontractors from the Contractor's previous payment requests that have not been made in accordance with the abovementioned contract provisions.
CONTRACTOR’S PAYMENT APPLICATION - PART III
AFFIDAVIT AND PARTIAL LIEN WAIVER FOR PREVIOUS PAYMENT REQUEST

4. **Exceptions (Payments Not Made for Work Over $1,000 in Value):** The Affiant further states that the amounts set opposite the preceding names have been paid and completely satisfied and that no such person or firm has any claim against the Owner for any labor, materials, or services furnished or work done by them on such account. Exceptions, if any, are stated below:

<table>
<thead>
<tr>
<th>Firm</th>
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</tbody>
</table>

5. **Payments for Work $1,000 or Less in Value:** The Affiant further states that all persons or firms who have done or are doing labor, have furnished or are furnishing materials, or have performed or are performing services on the project of the total value of ONE THOUSAND DOLLARS ($1,000.00) or less, have been paid in full and completely satisfied for the labor done, materials furnished, or service performed to the date hereof, and have no claims against the Owner for labor, materials or services done, furnished or performed by them on such account. Exceptions, if any, are stated below:

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<tr>
<th>Firm</th>
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</tbody>
</table>

6. **Compliance with the Contract Documents:** The Affiant further states that this affidavit is made on behalf of the Contractor for the purpose of complying with the Contract Documents.

Subscribed and sworn to before me this

____________________________day of _______________ 20_____.

Contractor ________________________

Notary Public ________________________

By ________________________

My Commission Expires _____________

Title ______________________

(Date)
CONTRACTOR'S PAYMENT APPLICATIONS: PART IV - EMPLOYEE UTILIZATION REPORT

Contractor:___________________________________  Project:___________________________________
____________________________________________  Project #:___________________________________
Contract Division:_________________________________  % Complete:______________________________
Contractor's IDHR #:____________________________  Payment No.:______________ Date:_____________
Owner: Board of Trustees, University of Illinois  Pay Period:__________________

TABLE A: CONTRACTOR'S WORKFORCE (includes Direct Subcontractors)

<table>
<thead>
<tr>
<th>Trade Codes</th>
<th>Job Titles</th>
<th>Total Employee</th>
<th>Black/ African Americn</th>
<th>Hispanic Americn</th>
<th>Asian Americn</th>
<th>Native Americn/ Alaskan Native</th>
<th>Employee Hours Worked</th>
</tr>
</thead>
<tbody>
<tr>
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<td>M</td>
<td>F</td>
<td>M</td>
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<tr>
<td>G1</td>
<td>Laborers</td>
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<tr>
<td>G1</td>
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<tr>
<td>G2</td>
<td>Equip Operators</td>
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<tr>
<td>G2</td>
<td>Truck Drivers</td>
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<tr>
<td>G3</td>
<td>Cement Finishers</td>
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<td>G4</td>
<td>Brick Masons</td>
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<td>Roofers/Metal Roofers</td>
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<td>G9</td>
<td>Painters</td>
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<td>Plasterers/Drywallers</td>
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<td>P15</td>
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<td>P/H15</td>
<td>Insulators</td>
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TABLE B

<table>
<thead>
<tr>
<th>Employee Hours Worked</th>
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<tbody>
<tr>
<td>Total</td>
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Page 1 of 2
<table>
<thead>
<tr>
<th>Subcontractor Included for this Report</th>
<th>Direct Subcontractor</th>
<th>Subcontract and Work</th>
<th>IDHR # (or FEIN)</th>
<th>Applicable Trade Codes</th>
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CERTIFICATION: The undersigned Contractor certifies that the information in this report is true and complete.

By: ________________________________________

Title: ______________________________________

DISTRIBUTION: Personnel Service EEO Office - 1 copy
Contract File - 1 copy
The above referenced contract is hereby amended to provide for the following described change(s) upon the terms set forth below:

Contractor shall provide: (SCOPE)

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
<th>Column C</th>
<th>TOTAL A+B+C</th>
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</thead>
<tbody>
<tr>
<td>Contractor’s Original Base Bid + Accepted Alternate(s)</td>
<td>Total of Previous Change Order(s)</td>
<td>Increase/(Decrease) by this Change Order</td>
<td>Contractor’s Revised Base Bid + Accepted Alternate(s) + Change Orders</td>
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<tr>
<td></td>
<td>Total of Previous Change Order(s) Assignment Fee</td>
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<tr>
<td>Contractor’s SUBTOTAL</td>
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<td>Total AS(s) increase(s) by this change order x 0.05</td>
<td>$</td>
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<td>Contractor’s Revised Change Order(s) Assignment Fee</td>
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</table>

| Plumbing AS Original Subcontract Sum           | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| Heating AS Original Subcontract Sum            | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| Ventilation AS Original Subcontract Sum        | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| Electrical AS Original Subcontract Sum         | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| Fire Protection AS Original Subcontract Sum    | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| AS Original Subcontract Sum                    | Total of Previous Change Order(s)             | Increase/(Decrease) by this Change Order     | Revised Subcontract Sum |
| GRAND TOTAL (Contractor’s Original Contract Sum) | GRAND TOTAL of Contractor’s Previous Change Order(s) | GRAND TOTAL of Contractor’s Increase/(Decrease) by this Change Order | GRAND TOTAL of Contractor’s SUBTOTAL + Revised Subcontract Sum(s) (“Contractor’s Revised Contract Sum”) |

As changed hereinabove, the above referenced contract shall continue in full force and effect.

CLASSIFICATION (for UI use only)  

<table>
<thead>
<tr>
<th>Client Request</th>
<th>PSC Error</th>
<th>CM Error</th>
<th>Code/Std</th>
<th>Unforeseen Conditions</th>
<th>BUDGET/SCOPE (for UI use only)</th>
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</thead>
<tbody>
<tr>
<td>Staff Request</td>
<td>PSC Omission</td>
<td>CM Omission</td>
<td>Delivery/Closeout</td>
<td>Affects project budget and/or scope</td>
<td></td>
</tr>
</tbody>
</table>

THE UNDERSIGNED HEREBY CERTIFY THAT THIS CONTRACT CHANGE ORDER IS GERMANE TO THE ORIGINAL CONTRACT AS SIGNED AND THAT THE CIRCUMSTANCES NECESSITATING THIS CONTRACT CHANGE ORDER WERE NOT REASONABLY FORESEEABLE AT THE TIME THE CONTRACT WAS SIGNED. THIS CONTRACT CHANGE ORDER IS IN THE BEST INTEREST OF THE UNIVERSITY OF ILLINOIS AND IS AUTHORIZED BY LAW.

PSC/Contractor Approvals Date 

University of Illinois Approvals Date
<table>
<thead>
<tr>
<th>Role</th>
<th>Date 1</th>
<th>Date 2</th>
<th>Date 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor</td>
<td></td>
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</tr>
<tr>
<td>Professional Services Consultant (PSC)*</td>
<td></td>
<td></td>
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<tr>
<td>Board of Trustees of the University of Illinois - Comptroller*</td>
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</table>

* Approvals only required for Contractor’s Change Order

Document Source: Template No Changes  Contract Type: Capital  Contract Sub Type: Construction
Date

Project Title

☐ Emergency Work Authorization (EWA) (No. ____________)

☐ Field Directive (FD) (Reference RFP # ________________)

Reason for Urgency:

Description of Problem:

Action to be Taken:

Total “Not to Exceed” Cost to Complete (Labor, Material, Mark up, etc.):

Minimum information to be included in this section: Costs shall not exceed $AMOUNT without prior written authorization by the Owner. Work to be invoiced on an hourly basis with daily time records submitted to the Contractor and Professional Services Consultant for approval. Time and Material backup information required for full payment at completion of Work. THE UNDERSIGNED HEREBY CERTIFY THAT THIS WORK IS GERMANE TO THE ORIGINAL CONTRACT AS SIGNED AND THAT THE CIRCUMSTANCES NECESSITATING THIS FIELD DIRECTIVE/EMERGENCY WORK AUTHORIZATION WERE NOT REASONABLY FORESEEABLE AT THE TIME THE CONTRACT WAS SIGNED. THIS FIELD DIRECTIVE/EMERGENCY WORK AUTHORIZATION IS IN THE BEST INTEREST OF THE UNIVERSITY OF ILLINOIS AND IS AUTHORIZED BY LAW.

Work Completion Required By: ____________ Date ____________.

Remarks:

Recommended by:

_________________________________________
CONTRACTOR (Name, Firm and Division(s) of Work)

Reviewed by:

_________________________________________
PSC (scope & estimated cost(s) reviewed)

Reviewed by:

_________________________________________
CM (scope & estimated cost(s) reviewed)

Reviewed by:

_________________________________________
PM (scope & estimated cost(s) reviewed)

Approved by:

_________________________________________
DIRECTOR or above for all EWA’s (CCU/UOCP&RES)
PROJECT MANAGER or above per approval authority for Field Directives.

pm/sec
c:

Professional Services Consultant
Construction Manager (if applicable)
Contractor(s)
Project File
STATE OF ILLINOIS )
COUNTY OF __________________________ ) SS

The Affiant, ____________________________________________________________, being first

duly sworn, upon oath deposes and says:

1. That the Affiant is ____________________ of __________________________ (hereinafter:
"the Contractor") who is the Contractor for the ______________________________________
Work upon the ________________________________ project constructed for The Board of
Trustees of the University of Illinois, (hereinafter: "the Owner") under a written contract dated
____________. between the Contractor and the Owner pertaining to the project;

2. That the Work under said contract is at least 90% complete and, to the extent completed, is
satisfactory and in accord with the provisions of the contract;

3. That all subcontractors, vendors, and suppliers who have furnished labor, materials, and/or
equipment to or who have performed Work for the Contractor in connection with said contract
or project of a total value of more than $1,000 have been paid all sums currently due and have
no liens, claims, or demands against the Owner or the State of Illinois other than that due for
retainage and uncompleted Work or services shown on the attached affidavit for the previous
payment request;

4. That all subcontractors, vendors, and suppliers who have furnished labor, materials and/or
equipment to or who have performed Work for the Contractor in connection with said contract
or project of $1,000 or less in value have been paid in full and have no liens, claims or
demands against the Owner or the State of Illinois;

5. That the attached affidavit for the previous payment request, partial and final waivers of lien, or
other evidence satisfactory to the Owner cover all labor, materials and equipment furnished
and all Work performed upon said project and that there are no other liens, claims, and
demands which have been, or could be, asserted against the Owner and/or the State of Illinois
in connection with said contract or project;

6. That this affidavit is made on behalf of the Contractor for the purpose of reducing the retainage
that has heretofore been withheld by the Owner under the provisions of Article 12 of the
General Conditions (entitled “Payments”) to the fixed sum of _______________________
Dollars ($________) (rounded to two significant digits), which represents
approximately ______ percent of the total contract value; and

7. That payment of said funds previously retained will satisfy any and all claims and demands
which the Contractor may have or assert against the Owner and/or the State of Illinois, except
the claim for the remaining unpaid balance on said contract, which includes the above-
mentioned remaining retainage.

Subscribed and sworn to before me this

_____ day of ________________, 20______.

Contractor: _______________________

Notary Public: _______________________

By: _____________________________

My Commission Expires: _______________

Title: ____________________________

Page 1 of 1
University of Illinois

CONTRACTOR'S AFFIDAVIT FOR FINAL PAYMENT

STATE OF ILLINOIS )
COUNTY OF __________________________ ) SS

The Affiant, ____________________________________________________________, being first duly sworn, upon oath deposes and says:

1. That the Affiant is ____________________ of __________________________ (hereinafter: "the Contractor") who is the Contractor for the ______________________________________ Work upon the ________________________________ project constructed for The Board of Trustees of the University of Illinois, (hereinafter: "the Owner") under a written contract dated ____________, between the Contractor and the Owner pertaining to the project;
2. That all bills incurred by the Contractor for labor and materials furnished by Contractor and for Work performed by Contractor in connection with said contract or project have been paid in full;
3. That all subcontractors, vendors, and suppliers who have furnished labor, materials, and/or equipment to or who have performed Work for the Contractor in connection with said contract or project have been paid in full and have no liens, claims, or demands against the Owner or the State of Illinois;
4. That this affidavit is made for the purpose of obtaining payment to the Contractor of the sum of ___________________________________________ Dollars ($_____________), which constitutes the full unpaid balance due the Contractor for all labor, materials, and equipment furnished to and all Work performed upon said project by the Contractor, whether under and pursuant to the provisions of said Contract and all subsequent modifications thereof or otherwise; and
5. That the payment of said sum to the Contractor will constitute payment in full to Contractor and will fully satisfy any and all liens, claims, and demands which the Contractor may have or assert against the Owner and/or the State of Illinois in connection with said contract or project.
6. That the total value of the contract as identified above is as follows:

<table>
<thead>
<tr>
<th>Shell</th>
<th>Fixed Equipment</th>
<th>Movable Equipment</th>
<th>Building Service Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI 01-10, 13, 21, 31-34</td>
<td>CSI 11, 41, 42, 45</td>
<td>CSI 12</td>
<td>CSI 14 (conveying systems)</td>
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<td>(including all changes to contract)</td>
<td>(furnishings)</td>
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<tr>
<td>Building Service Systems</td>
<td>Building Service Systems</td>
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<tr>
<td>CSI 22, 23, 44 (mechanical)</td>
<td>CSI 25-28, 40, 48 (electrical)</td>
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</table>

Subscribed and sworn to before me this ______ day of ______________, 20______.

Contractor: ____________________________

Notary Public: ____________________________

By: ____________________________

My Commission Expires: _______________

Title: ____________________________
CONTRACTOR’S FINAL RELEASE AND WAIVER OF LIEN

Project

Name: _____________________________

Address: ___________________________

City                                       State                        Zip

Contract

Name: ____________________________

Address: ___________________________

City                                        State                       Zip

Owner: The Board of Trustees of the University of Illinois

Contract Division: _______________________

Contract Date: ______ / _____ / _____

TO ALL WHOM IT MAY CONCERN:

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned Contractor hereby waives, discharges, and releases any and all liens, claims, and rights to liens against the above-mentioned project, and any and all other property owned by or the title to which is in the name of the above-referenced Owner and against any and all funds of the Owner or the State of Illinois appropriated or available for the construction of said project, and any and all warrants drawn upon or issued against any such funds or monies, which the undersigned Contractor may have or may hereafter acquire or possess as a result of the furnishing of labor, materials, and/or equipment, and the performance of Work by the Contractor on or in connection with said project, whether under and pursuant to the above-mentioned contract between the Contractor and the Owner pertaining to said project or otherwise, and which said liens, claims or rights of lien may arise and exist under and by virtue of an act of the General Assembly of the State of Illinois entitled, “Mechanics Lien Act”, as amended.

The undersigned further hereby acknowledges that the sum of ____________________________ Dollars ($____________________) constitutes the entire unpaid balance due the undersigned in connection with said project whether under said contract or otherwise and that the payment of said sum to the Contractor will constitute payment in full and will fully satisfy any and all liens, claims, and demands which the Contractor may have or assert against the Owner and/or the State of Illinois in connection with said contract or project.

Dated this ___ day of ______ 20____

Witness to Signature:

____________________________________

____________________________________

Contractor

By: ________________________________

Title: _______________________________

Page 1 of 1
University of Illinois  
FINAL RELEASE AND WAIVER OF LIEN FOR  
SUBCONTRACTORS/VENDORS/SUPPLIERS

<table>
<thead>
<tr>
<th>Subcontractor/Vendor/Supplier</th>
<th>Project</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: _______________</td>
<td>Name: _______________</td>
<td>Name: _______________</td>
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<tr>
<td>Address: _______________</td>
<td>Address: _______________</td>
<td>Address: _______________</td>
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<tr>
<td>Work Done: ___________</td>
<td>Owner: The Board of Trustees of the University of Illinois</td>
<td>Work Done: ___________</td>
</tr>
<tr>
<td>Subcontract/PO#: ________</td>
<td>Contract Date: <em><strong>/</strong>/</em>__</td>
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</table>

TO ALL WHOM IT MAY CONCERN:
For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned Subcontractor/Vendor/Supplier hereby waives, discharges and releases any and all liens, claims, and rights to liens against the above-mentioned project, against any and all other property owned by or the title to which is in the name of the above-referenced Owner, against any and all funds of the Owner or the State of Illinois appropriated or available for the construction of said project, and against any and all warrants drawn upon or issued against any such funds or monies, which the undersigned may have or may hereafter acquire or possess as a result of the furnishing by the Subcontractor/Vendor/Supplier of labor, materials, and/or equipment or the performance of Work by the Subcontractor/Vendor/Supplier on or in connection with said project, whether under and pursuant to the subcontract between Subcontractor/Vendor/Supplier and the above-referenced Contractor pertaining to said project or otherwise, and which said liens, claims, or rights of lien may arise and exist under and by virtue of an act of the General Assembly of the State of Illinois entitled, "Mechanics Lien Act", as amended.

The undersigned Subcontractor/Vendor/Supplier acknowledges that it has no claim or demand of any nature or amount against the Owner for furnishing any labor, materials and/or equipment for, or the performance of any work upon said project, or for anything arising or occurring in connection with said project, whether under said contract between the undersigned and said Contractor or otherwise, and hereby fully and completely releases and discharges the Owner and/or the State of Illinois from any and all such claims.

Dated this ___ day of _____ 20____

Witness to Signature: ________________________________

______________________________ Subcontractor/Vendor/Supplier

By: ________________________________

Title: ________________________________

Page 1 of 1
University of Illinois
CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: ____________________________________________  Project #: ____________________

Owner: The Board of Trustees of the University of Illinois

Professional Services Consultant: ____________________________________________________

Contractor:  

Inspection Date: _____/___/______

Owner Possession Date: _____/___/______

Contract Division: ____________________

---

INSPECTION

<table>
<thead>
<tr>
<th>Inspection Participants</th>
<th>Representing (Firm or Agency)</th>
<th>Areas or Sections Inspected for Occupancy</th>
</tr>
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LIST

A list of items to be completed or corrected by the Contractor prior to final payment has been prepared by the Professional Services Consultant and is attached to this document. Failure to include any uncompleted, faulty or deficient item on the list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise required by the specifications, the Contractor shall guarantee all of the work performed under this contract against defects in material and workmanship in accordance with the Contract Documents and Federal and State laws and regulations.

---

POSSESSION

The above referenced Project area has been inspected and found to be substantially complete and ready for Owner possession and occupancy in accordance with the Contract Documents. The Owner accepts full possession and responsibility for the above designated Project or area at 12:01 p.m. of the Owner possession date. The responsibility of the Contractor for utilities ceases at the stated possession time. The insurance required under the contract remains the responsibility of the Contractor.

---

FINAL PAYMENT

The Contractor shall notify the Professional Services Consultant and the Owner in writing (in accordance to Article 9.7 of the General Conditions) when the Work is fully completed and ready for final inspection. The Professional Services Consultant, upon finding the Work acceptable and the contract fully performed, shall promptly certify final payment to the Contractor in accordance with the Contract Documents.
CERTIFICATE OF SUBSTANTIAL COMPLETION
EXTENDED WARRANTIES

Extended warranties are listed below:

<table>
<thead>
<tr>
<th>Item</th>
<th>CSI Section</th>
<th>Date of Commencement</th>
<th>Duration</th>
<th>Date of Expiration</th>
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<tbody>
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<td>12.</td>
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</table>

Failure to include any item on the extended warranty list does not relieve the Contractor of the responsibility to guarantee the Work in accordance with the Contract Documents. (Attach any bonds or guarantees required by the Contract Documents or documentation of extended warranty dates agreed upon by the undersigned parties.)

SIGNATURES

Contractor

Construction Manager (when applicable)

Professional Services Consultant

Facilities Management Representative (UIC only)

Campus Construction Unit PM

Affirmative Action
Risk Management
UIUC/UIS Physical Plant Representative
UIC Director, Project Management Services, OCP
Campus Parking
Departmental Representative
Project File

Copies: All above signed parties
**UNIVERSITY OF ILLINOIS**  
Urbana-Chicago-Springfield  

*Contractor/Subcontractor Request For Proposal Breakdown Summary*

### RFP INFORMATION

<table>
<thead>
<tr>
<th><strong>PROJECT:</strong></th>
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<tbody>
<tr>
<td><strong>RFP NO:</strong></td>
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<tr>
<td><strong>RFP DATE:</strong></td>
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<tr>
<td><strong>CONTRACTOR:</strong></td>
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</table>

### SUMMARY OF DETAILED BREAKDOWN

<table>
<thead>
<tr>
<th></th>
<th><strong>ADDITIONS</strong></th>
<th><strong>DELETIONS</strong></th>
<th><strong>NET TOTAL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. MATERIAL</strong></td>
<td>$</td>
<td>$</td>
<td>$</td>
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<tr>
<td><strong>B. LABOR</strong></td>
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<tr>
<td><strong>C. OTHER</strong></td>
<td>$</td>
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<tr>
<td><strong>D. NET TOTAL</strong></td>
<td>(Lines A+B+C)</td>
<td></td>
<td>$</td>
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<tr>
<td><strong>E. OVERHEAD AND PROFIT</strong></td>
<td>(Line D x 15%; if net total is credit, then 5%)</td>
<td></td>
<td>$</td>
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<tr>
<td><strong>F. SUBTOTAL, CONTRACTOR</strong></td>
<td>(Lines D+E)</td>
<td></td>
<td>$</td>
</tr>
</tbody>
</table>

### CONTRACTOR’S MARKUP ON WORK OF SUBCONTRACTORS

<table>
<thead>
<tr>
<th><strong>SUBCONTRACTOR:</strong> Firm Name</th>
<th><strong>CONTRACT WORK:</strong> Description</th>
<th><strong>PROPOSAL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>5.</td>
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</table>

**G.** SUBTOTAL of all work performed by the contractors subcontractors $  
**H.** CONTRACTOR’S MARK-UP on work of subcontractors $  
**I.** SUBTOTAL, SUBCONTRACTORS (Line G x 5%; if subtotal is credit, then 0%) $  

### PROPOSAL

| **J.** | **WORK PERFORMED BY CONTRACTOR AND SUBCONTRACTORS** | (Lines F+I) | $ |
| **K.** | **INSURANCE*, BOND AND TAXES** | (enter % here)---> 0.00% | $ |
| **L.** |  |  | $ |

*Include builder’s risk insurance coverage increase if contractor is carrying builder’s risk insurance and if change order impacts builder’s risk insurance.*

The request for proposal will increase (decrease) the contract amount.  
Work will increase (decrease) the contract completion date by _____ calendar days.

**CONTRACTOR SIGNATURE:____________________ DATE:_________**  
**Title:____________________**

Rev. 1/01
**PROFESSIONAL SERVICES BILLING FORM**

**UNIVERSITY OF ILLINOIS**

PROFESSIONAL SERVICES CONSULTANT (PSC): ________________

PROJECT: ____________________________

OWNER’S REPRESENTATIVE: ____________________________

AGREEMENT DATE: ____________________________

INVOICE DATE: __________________

UNIVERSITY PAYMENT#: __________

PAY PERIOD: _______To_______

FEIN/FTIN #: __________________

CONSULTANT SECTION: (Includes Subconsultant’s fees)

<table>
<thead>
<tr>
<th>DESCRIPTION PHASE AND/OR AMENDMENT NO.**</th>
<th>CONSULTANT MBE/FBE/NA STATUS</th>
<th>SCHEDULED VALUE</th>
<th>EARNED TO DATE</th>
<th>AMOUNT PREVIOUSLY BILLED</th>
<th>AMOUNT OF THIS BILLING</th>
<th>TOTAL BILLED TO DATE</th>
<th>UNBILLED BALANCE</th>
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** Includes individual listing of any consultant/subconsultant either within original contract or those added by amendment(s).

SUBCONSULTANT SECTION:

<table>
<thead>
<tr>
<th>SUBCONSULTANT (of the above totals, identify how much will be paid out to Subconsultants for each phase)</th>
<th>SUB CONSULTANT MBE/FBE/NA STATUS</th>
<th>SCHEDULED VALUE</th>
<th>EARNED TO DATE</th>
<th>AMOUNT PREVIOUSLY BILLED</th>
<th>AMOUNT OF THIS BILLING</th>
<th>TOTAL BILLED TO DATE</th>
<th>UNBILLED BALANCE</th>
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</table>

** Includes individual listing of any consultant/subconsultant either within original contract or those added by amendment(s).

NOTE: Attach appropriate statements, time sheets, invoices, etc.

Remarks: ____________________________________________

Submitted by: ____________________________________________

(Professional Services Consultant)

Approved by: ____________________________________________

(Owner’s Representative)

END OF DOCUMENT 00 60 00
THE BIDDING AND CONTRACT PROVISIONS
DOCUMENT 00 70 00 – GENERAL CONDITIONS
(Standard Multiple and Single Contract Sets)

GENERAL CONDITIONS

1.0 ARTICLE 1 - DEFINITIONS

1.1 "Applicable Laws" means all laws, statutes, ordinances, codes, building codes, regulations, rules, orders and resolutions of all federal, administrative, state, local, municipal, and other governing bodies having jurisdiction over the Project or the performance of the Work.

1.2 “Change Order” means a written order to a Contractor executed by the Owner in accordance with the contract authorizing and directing an addition to, deletion from, or adjustment or revision of the requirements of the Contract Documents, or an adjustment to the compensation payable to Contractor, or to the time for performance of the contract and completion of the Project, or a combination thereof. All additional expenditures related to Work performed or material purchased through an agreement with a Contractor will ultimately take the form of a Change Order.

1.3 “Construction Documents” means the complete and final design and construction documents provided by Professional Services Consultant pursuant to the contract between Owner and Professional Services Consultant and shall include the drawings, specifications, and all changes and modifications thereto, prepared by or on behalf of Professional Services Consultant for use in constructing the Project, performing the Work, and rendering the Project fully operational.

1.4 “Contract Documents” See paragraph 2.1 herein.

1.5 “Emergency Work Authorization” means a written order to a Contractor executed by the Owner in accordance with the Agreement and directing an adjustment to the Contract Document requirements. An Emergency Work Authorization shall be utilized only in instances of a threat to public health or safety, loss of or damage to property or the integrity of vital records, or severe disruption of essential services. Issuance of an Emergency Work Authorization is entirely within the discretion of the Owner. Prior to commencement of Work, the Owner shall set forth on the appropriate form “not-to-exceed” time and material costs for the contemplated expenditure. An Emergency Work Authorization is preliminarily authorized/supported with appropriate documentation and ultimately utilizes the Change Order form.

1.6 “Field Directive” means a written order to a Contractor executed by the Owner in accordance with the contract authorizing and directing an addition to, deletion from, or adjustment or revision to the requirements of the Contract Documents, or an adjustment to the compensation payable to Contractor, or to the time for performance of the contract and completion of the Project, or a combination thereof. Field Directives may only be utilized in distinct and exceptional situations when, due to circumstances beyond the Owner’s control, a proposed Change Order is in dispute or the contemplated time of completion for the normal Change Order process could adversely affect the project. Prior to commencement of Work, the Owner shall set forth on the appropriate form “not-to-exceed” time and material costs for the contemplated expenditure. A Field Directive is preliminarily authorized/supported with appropriate documentation and ultimately utilizes the Change Order form.

1.7 “Final Completion” means the completion by the Contractor of all Work required by, and in strict compliance with, the Contract Documents.
1.8 “Good Faith Effort Period” means the Bidder has ten (10) calendar days after the bid opening to submit documentation of its good faith efforts to achieve the MBE/FBE goals if the goals are not met.

1.9 “MBE/FBE Participation Cure Period” means if the Bidders fail to meet the MBE/FBE participation goal at the time of bid submittal, they are granted a cure period of ten (10) calendar days to meet the goal. The cure period shall run concurrently with the Good Faith Effort Period.

1.10 "Owner’s Representative" means the individual named by Owner, in writing and as such writing may be amended from time to time, to act on Owner’s behalf in the administration of this contract. Except as set forth in the specifications, Division 01 00 00 - General Project Requirements, the Owner's Representative does not have authority to waive or modify any condition or term of the Contract Documents.

1.11 "Professional Services Consultant" means the architect, engineer or other professional named in the Agreement and any successor that Owner may retain in connection with the Project.

1.12 “Project” means the project identified on page one of the Agreement.

1.13 "Subcontracts" means the contracts between Contractor and any Subcontractor, including any contracts assigned to the Contractor by the Owner.

1.14 “Subcontract Costs” means those sums properly paid or due and payable to Subcontractors under the terms of the Subcontracts.

1.15 "Subcontractor" means any person or entity having a direct or assigned contract or purchase order with Contractor for the performance or supply of all or any portion of the Work required by the Contract Documents or the supply of any materials, services, equipment or installation services required by the Contract Documents.

1.16 "Substantial Completion" means that stage of completion of the Project, or such agreed discrete portion thereof, such that the Work and the Project, or such agreed discrete portion thereof, are functionally and legally usable by Owner for the purpose for which they are intended.

1.17 "Work" means any and all labor, supervision, work, supplies, fixtures, furnishings, vehicles, equipment, services, tools, materials, computers, utilities, items, documents and things required by the Contract Documents to be performed or supplied. For purposes only of determining Final Completion, "Work" shall not include those things expressly required by the Contract Documents following Final Completion.

2.0 ARTICLE 2 - THE CONTRACT DOCUMENTS

2.1 Contract Documents Defined. The contract between the parties consists of the “Contract Documents.” The Contract Documents include the Agreement, these General Conditions, the Construction Documents, any supplemental conditions, any special conditions, any subsequent Change Orders, field orders, and other written amendments to the Agreement, and all documents expressly annexed as part of the Agreement. Documents not described above are not Contract Documents and do not constitute part of the contract between the parties.

2.2 Priority of Documents. In the event of any conflict, discrepancy, or inconsistency among the Contract Documents, interpretation shall be based on the following descending order of priority:

2.2.A the Agreement.

2.2.B supplemental or special conditions (if any).

2.2.C the General Conditions.
2.2.D specifications.
2.2.E drawings, and among the drawings, the following:
2.2.E.1 as between figures given on drawings and scaled measurements, the figures shall govern;
2.2.E.2 as between large scale drawings and small scale drawings, the large scale drawings shall govern.

In the event that Work is called for by the drawings but not by the specifications, or by the specifications but not by the drawings, the Contractor shall be responsible for such Work.

2.3 Intent. The intention of the Contract Documents is to include all labor, materials, equipment, transportation, construction plant, and facilities necessary for the proper execution and completion of the Work, and the terms and conditions of payment therefor. All work not specifically excluded in the Contract Documents which is reasonably and properly inferable therefrom, or from accepted trade practice, or which is necessary for the proper completion of the Work, is included even though not specifically mentioned in or called for by the Contract Documents.

3.0 ARTICL3E 3 - REPRESENTATIONS AND WARRANTIES

3.1 Representations and Warranties. Contractor makes the following representations and warranties to Owner:

3.1.A Contractor is professionally qualified to act as the Contractor for the Project and has, and shall maintain, any and all licenses, permits, and other authorizations necessary to act as the Contractor for the Project and to perform the Work required hereunder.

3.1.B Contractor has become familiar with the Contract Documents provided to date and will become familiar with all provided hereafter, and has become familiar with the Project site and the local conditions under which the Project is to be constructed.

3.1.C Contractor has the capability and experience, including sufficient qualified and competent supervisory personnel, to efficiently and timely accomplish the Work, and Contractor will continuously furnish sufficient personnel to accomplish the Work in a timely and efficient manner.

3.1.D Contractor shall comply, and shall cause all Subcontractors to comply, with all Applicable Laws.

3.1.E Contractor assumes full responsibility to Owner for the acts and omissions of its officers, employees, Subcontractors, consultants, and others employed or retained by it or them in connection with the performance of the Work.

3.1.F Contractor warrants to Owner that all labor furnished to perform the Work under the Contract Documents will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by the Contract Documents, and that the Work will be of good quality, free from faults and defects, and in strict conformance with the Contract Documents. Any Work not conforming to these requirements may be considered defective.

3.1.G All obligations related to or arising from all representations and warranties made in the Contract Documents shall be obligations of, and shall be deemed incorporated in, the performance bond furnished by Contractor.

3.2 Enumerated Representations and Warranties Not Exhaustive. The representations and warranties enumerated in this Article 3 operate in addition to, and shall not supersede,
limit, or restrict any other duty, responsibility, representation, or warranty, express or implied, created or required by the Contract Documents or by law.

4.0 **ARTICLE 4 - CONTRACTOR’S DUTIES: GENERAL PROVISIONS**

4.1 **Generally.** Contractor shall perform and provide the Work required by, or reasonably implied by or inferable from, the Contract Documents, shall be responsible for the construction of the Project in conformance with the requirements of the Contract Documents, and shall pay for all labor, supervision, materials, supplies, furnishings, fixtures, equipment and things required by the Contract Documents.

4.2 **Standard of Care.** Contractor shall perform the Work at a level, and be judged by a standard of care, that is consistent with the standards and quality prevailing among nationally recognized contracting firms of superior knowledge, skill and experience engaged in projects of similar size and complexity. Contractor shall carry out and complete the Work in an efficient, economical and timely manner, as expeditiously as is consistent with the level of skill and care required hereby and the interests of Owner, and in strict accordance with the Contract Documents.

4.3 **Permits, Notices, and Fees.** Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for completion of the Work which are customarily secured after execution of the contract. The Contractor shall comply with, and give notices required by, Applicable Laws. Except as above provided, Owner shall obtain necessary approvals, easements, and shall pay for assessments and charges required for construction.

4.4 **Compliance with Applicable Laws.** Contractor shall reasonably ensure that the Work is performed, and the Project is constructed, in a manner which meets the requirements of all Applicable Laws relating to the construction, occupation, and operation of the Project, including, but not limited to, building codes, fire and safety regulations, and environmental regulations. Such Applicable Laws shall be deemed minimum standards for the Project. Where the requirements of the specifications and the accompanying drawings exceed those of the Applicable Laws, the drawings and specifications shall control. Contractor shall immediately report to Owner’s Representative in writing any known or anticipated violation by any Subcontractor of any Applicable Law.

4.5 **Communications in Writing.** All communications relating to the Project between Contractor and Owner’s Representative shall be in writing or, as applicable, shall be confirmed in writing.

4.6 **Reporting Anticipated Delays.** Should Contractor, at any time during the course of the Project, have reason to believe that Contractor, Professional Services Consultant, or any Subcontractor will be unable to meet a completion date of any activity which is on the critical path of the Project or which may delay Contractor, any Subcontractor, the Professional Services Consultant, or the progress of the Project, Contractor shall immediately notify Owner’s Representative in writing, stating the reason for the delay, describing steps being taken to remedy the delay, and recommending steps for eliminating or reducing the extent and impact of such delays.

4.7 **Duty to Correct.** Contractor shall promptly correct any errors, omissions, deficiencies, or conflicts in the Work at its own cost and without additional compensation or reimbursement, and Contractor shall not be compensated or reimbursed for performing any services necessitated by its failure to perform in strict accordance with the Contract Documents.

4.8 **Cooperation of Contractor and Subcontractors.** The Contractor shall cooperate and work in harmony with its Subcontractors and other contractors so that all of the Work will be performed without undue delay or friction.
The Contractor shall allow its Subcontractors and other contractors adequate time to furnish and locate sleeves, openings, inserts, hangers, anchors, conduits, and other items of any description which are to be built into the Work. Any delays or prospect of delay shall be promptly reported in writing to the Professional Services Consultant.

If any part of the Contractor’s Work depends for proper execution or results upon other work, the Contractor shall inspect and promptly report to the Professional Services Consultant any defects in such Work that render it unsuitable for such proper execution and results. The Contractor’s failure so to inspect and report shall constitute an acceptance of the other work as fit and proper for the reception of the Contractor’s Work, except as to defects which may develop in the other work after the execution of the Contractor’s Work.

To insure the proper execution of the Contractor’s subsequent Work, the Contractor shall measure Work already in place and shall at once report to the Professional Services Consultant any discrepancy between the executed Work and the Drawings.

5.0 **ARTICLE 5 - CONSTRUCTION SCHEDULE**

5.1 Preparation of Schedule. Within fifteen (15) days after receipt of the Notice to Proceed from the Owner, Contractor shall provide to Owner’s Representative and Professional Services Consultant a detailed schedule for performance of all of the Work (the “Construction Schedule”). The Construction Schedule shall be in such form as Owner may require, shall, unless otherwise agreed by Owner in writing, utilize the critical path method of scheduling, and shall conform to the established Substantial Completion Date. The Construction Schedule shall coordinate and sequence all activities and performance by all participants in the construction of the Project, including Owner, Contractor, Professional Services Consultant and Subcontractors. The Construction Schedule shall identify those activities and events which are on the critical path.

5.2 Owner’s Acknowledgment of Construction Schedule. Upon Owner’s written acknowledgment of the Construction Schedule, Contractor may proceed in accordance therewith; provided, however, Owner’s acknowledgment of any schedule shall only indicate Owner’s acknowledgment of the dates contained therein and shall not constitute ratification or approval of the accuracy, adequacy, or logic of such schedules, or of the means, methods, manner or sequence of Work contained in such schedules. Owner’s acknowledgment of the Construction Schedule shall in no way diminish Contractor’s duties to schedule and coordinate the Work, which shall remain Contractor’s sole responsibility, and shall not diminish or excuse Contractor’s duties to perform in a manner so as to achieve timely completion of the Project. In no event shall updates to the Construction Schedule provided by Contractor whether or not objected to or acknowledged by Owner, constitute evidence of an adjustment in the Substantial Completion Date or Contractor’s entitlement to additional compensation hereunder.

5.3 Updating of Schedules. Contractor shall update the Construction Schedule on a monthly basis throughout the construction of the Project to reflect accurately Work accomplished and to be accomplished. Such updates of the Construction Schedule shall be furnished to Owner’s Representative and Professional Services Consultant monthly and shall detail all elements of Project progress and shall identify any delays relating to any activity on the critical path of the Project, the cause and extent of same, the projected impact on Substantial Completion of the Project by the Substantial Completion Date, and steps being taken and recommendations for eliminating or reducing the extent of such delays.

5.4 Expediting to Maintain Schedule. Contractor at its sole expense, shall take all reasonable steps to expedite performance of any activity, contract, delivery, or inspection where necessary to mitigate any delay, to maintain the Construction Schedule, and to achieve Substantial Completion by the Substantial Completion Date.

6.0 **ARTICLE 6 - SUBCONTRACTS**
6.1 Contractor to Subcontract. Contractor shall enter into Subcontracts with Subcontractors for the performance of those portions of the Work not performed directly by the Contractor. Except as set forth in paragraph 6.2, Contractor shall, within thirty (30) days after notification of award of the contract, notify the Owner and the Professional Services Consultant in writing of the names of Subcontractors proposed for the principal parts of the Work and for such others as the Professional Services Consultant may direct. Contractor shall simultaneously provide the Professional Services Consultant and the Owner’s Representative with such written information as Owner deems necessary in order to determine whether to object to the Contractor’s hiring of any Subcontractor or consultant, including proof of license. If no objection is interposed by the Owner within seven (7) days of its receipt of such information, Owner shall be deemed to have no such objection and Contractor may execute such Subcontract and shall furnish Owner a copy of same. Contractor shall not subcontract for any part of the Work with any Subcontractor or consultant (including affiliates and subsidiaries of Contractor) who is not properly licensed or against whom Owner has a reasonable objection. The Contractor shall bind every Subcontractor by all of the provisions of the Contract Documents which are applicable to such Subcontractor’s Work unless specifically noted to the contrary in a Subcontract approved in writing by the Owner. The Contractor shall pay the Subcontractor the amount allowed to the Contractor on account of the Subcontractor’s work to the extent of the Subcontractor’s interest therein, or pay the Subcontractor to such extent as may be provided by the Contract Documents or the Subcontract, if either of these provides for earlier or larger payments than the above. Nothing in paragraph 6.1 shall create any obligation on the part of the Owner to pay or to see to the payment of any sums to any Subcontractor.

6.2 Related Parties. Contractor must notify Owner in writing of the specific nature of any contemplated transaction with any Related Party and any such transaction must be approved in writing by Owner before the transaction is consummated or costs are incurred. A “Related Party” may include any of the following: a parent, subsidiary or other entity having common ownership or management with Contractor; entities in which stockholders in, or management employees of, Contractor owns an interest; any person or entity with the right to control the business or affairs of Contractor; and any member of the immediate family of any such person. The terms of any such transaction shall conform to the requirements of the Contract Documents, including, but not limited to, the right to audit books and records pertaining to the Work undertaken by such Related Party, which audit may be undertaken by Owner or its representatives. All other terms and provisions of any such subcontract are subject to Owner’s approval. All savings under any such subcontract shall be applied to reduce the Owner’s costs under this Agreement and profit related to the transaction shall not be payable to any such Related Party.

6.3 Assignment of Contracts. In compliance with the Illinois Procurement Code, the following five (5) subdivisions of the Work, if applicable to this Project, were separately advertised for bids by the Owner:

- plumbing;
- heating, piping, refrigeration, and automatic temperature control systems, including the testing and balancing of those systems;
- ventilating and distribution systems for conditioned air, including the testing and balancing of those systems;
- electric wiring; and,
- general contract work.

The Owner has accepted the lowest responsive bid from a responsible bidder for each subdivision of the Work above indicated, and has awarded contracts to
each. Upon executing contracts for the subdivisions of the Work above indicated excluding the subdivision of the Work bid upon by the Contractor, Owner has assigned all of its rights and delegated all of its duties therein to the Contractor who accepts said assignment and delegation, and subsequently shall be responsible to Owner for performance of the Work to be performed pursuant to such assigned contracts. Such assigned contracts, and such assigned contractors, are sometimes referred to herein as “Assigned Subcontracts” and “Assigned Subcontractors”, respectively.

6.3.A Status of Assigned Subcontractors. Upon such assignments, the contractors holding contracts which have been assigned shall become Subcontractors of the Contractor and shall no longer have any rights under the contracts against the Owner or duties or obligations under the contracts to the Owner, but all of their rights under the contracts shall be against the Contractor and all of their duties and obligations under the contracts shall be to the Contractor. Excluding paragraph 2.3 of the Contractors Agreement (Document Section 00 50 00) between the Owner and the Contractor, the Assigned Subcontractors and the Contractor shall be bound to each other by the Contract Documents to the same effect and extent as the Owner and the Contractor are so bound, but only insofar as the Contract Documents relate to each Assigned Subcontractor’s scope of the Work.

6.3.B Status of the Contractor. Upon such assignment, the Contractor shall be responsible for the performance of the Work and shall be as fully responsible to the Owner for the acts and omissions of the Assigned Subcontractors and all persons either directly or indirectly employed by them as the Contractor is for the acts and omissions of persons directly employed by the Contractor or with whom the Contractor has directly entered into Subcontracts for portions of the Work to be performed by Contractor.

6.3.C Payment of Assigned Subcontractors. The Contractor shall be responsible to the Assigned Subcontractors for all payments and the Assigned Subcontractors shall look to the Contractor for such payments but all payments becoming due to the Contractor under the terms and conditions of the Contractor’s contract with the Owner for Work performed by an Assigned Subcontractor shall be made by the Owner directly to the Assigned Subcontractor performing such Work upon compliance by the Assigned Subcontractor with the terms, conditions and requirements of its Assigned Subcontract.

6.3.D Contractor’s Approval of Payments to Assigned Subcontractors. The written approval of the Contractor shall be a condition precedent to payment of any Assigned Subcontractor. Within seven (7) days after a request for approval for the making of a payment to an Assigned Subcontractor has been submitted to the Contractor, the Contractor shall furnish its approval thereof or state in writing its reasons for withholding such approval.

Except as provided in this paragraph 6.2, the Contractor shall subcontract directly with all Subcontractors.

6.4 The documents and information for the contractors and subcontractors listed in Table 1 and as described below must be provided by the Owner to the Chief Procurement Officer for Higher Education.

Table 1: Contracts and Level Descriptions

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Level</th>
<th>Contract</th>
<th>Dollar amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor without Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Contractor with Assigned</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
<tr>
<td>Assigned Subcontractor</td>
<td>1</td>
<td>With Owner</td>
<td>All</td>
</tr>
</tbody>
</table>
Subcontractor

<table>
<thead>
<tr>
<th>Subcontractor</th>
<th>2</th>
<th>With Level 1</th>
<th>&gt; $50,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcontractors’ Subcontractor *</td>
<td>3 and below</td>
<td>With Level 2 and below</td>
<td>&gt; $50,000</td>
</tr>
</tbody>
</table>

* For any subcontractor beyond level 3 with a contract value > $50,000 shall also be included.

**Level 1 Contractor**

The Certifications and Statutory Requirements form and the Financial Disclosures and Conflicts of Interest form submitted by the Level 1 Contractor with the bid documents are hereby made a part of this Contract.

It is the responsibility of the Level 1 Contractor to provide the following with respect to each Level subcontract* which exceeds $50,000. The forms shall be completed and signed by each Level subcontractor*.

- subcontractor(s) name(s)
- address(es)
- subcontract value(s)
- general type(s) of work to be performed
- Certifications and Statutory Requirements form(s)
- Financial Disclosures and Conflicts of Interest form(s),

The documents submitted to the Owner shall be in electronic pdf format and follow the Owner's file naming convention. The forms and file naming convention can be found at: http://www.uocpres.uillinois.edu/contractors/contracts. These documents shall be provided to the Owner within 15 calendar days after the execution of the Contract or after execution of the subcontract, whichever is later.

The Level 1 Contractor must provide the above information for any Level subcontractors* added or changed which results in a contract value exceeding $50K during the term of the contract.

Any subcontracts entered into prior to receiving a fully executed copy of the Contract are done at the Contractor’s or Assigned Subcontractor’s own risk.

6.5 **Coordination of the Subcontracts.** Except as set forth in paragraph 6.2 above, neither Owner nor Professional Services Consultant assumes any responsibility for defining the limits on any Subcontracts on account of the arrangement of the specifications or drawings. As part of the bidding and award of Subcontracts, Contractor shall ensure that the Subcontracts are coordinated so that all of the Work is properly and clearly allocated among, and assigned to, Contractor and Subcontractors without omission, conflict, or duplication. Contractor shall carefully review all Subcontracts to ensure: (a) that all subcontracted parts of the Work are assigned to appropriate Subcontractors; (b) that, unless provided for by Contractor, provisions are made for temporary facilities and utilities necessary for the performance of the Work and for Project site facilities necessary for Contractor, Owner, and Professional Services Consultant to perform their duties in the management, inspection, and supervision of the Work; (c) that responsibility for Project safety programs is properly assigned; (d) that they are in compliance with Applicable Laws; and (e) that they are in compliance with Owner’s and Contractor’s guidelines, if any.

6.6 **Competitive Procurement.** If directed by Owner, Contractor shall use competitive procurement methods in conformance with Owner’s procurement policies and with any rules and regulations of any governing authority who has jurisdiction over the Project.

6.7 **Contractor Responsible for Acts of Subcontractors.** Contractor’s subcontracting of the Work, and Owner’s consent and approval of Contractor’s subcontracting with any
Subcontractor, shall not relieve Contractor from any liability or obligation under the Contract Documents or under any Applicable Laws. Contractor shall be responsible for any and all acts, defaults, omissions or negligence of its Subcontractors and consultants, and shall be and remain liable and obligated to Owner for all Work subcontracted. Except as set forth in paragraph 6.2, no relationship of agency, employment, contract, obligation or otherwise shall be created between Owner and any Subcontractor or consultant of Contractor, and a provision to this effect shall be inserted into all Subcontracts and other agreements between Contractor and its Subcontractors and consultants. In no event shall Owner be liable to any of Contractor’s Subcontractors for Work performed by such Subcontractor on behalf of the Contractor or for the Project. Professional Services Consultant will not be asked to resolve disputes between Contractor and any Subcontractor or disputes between Subcontractors.

6.8 Procurement of Special Services. Contractor shall schedule and coordinate services from surveyors, testing laboratories, and other special consultants required for the completion of the Work.

6.9 Orders of Materials, Fixtures, Furnishings and Equipment. Contractor shall schedule, coordinate, expedite, and effect the purchase and delivery to the Project site of materials, fixtures, furnishings and equipment required to be provided by Contractor pursuant to the Contract Documents. Contractor shall perform expediting and inspection services after the placement of all such orders.

6.10 Substitutions. If Owner elects to accept any item(s) proposed by Contractor as a substitution, Contractor shall assume full responsibility for the proper performance of such substituted item(s) and shall assume the costs of any changes in the Work which may be due to such substitution.

6.11 Procurement of Materials, Fixtures, Furnishings and Equipment on Owner’s Behalf. Contractor shall be responsible for scheduling and coordinating, and if requested by Owner’s Representative, for purchasing and for arranging appropriate delivery, storage and security for, all materials, furnishings, tools, fixtures, computers, and equipment to be furnished by Owner under the terms of the Contract Documents for use in performance and completion of the Work. The purchase price and transportation and storage costs associated with such items shall be borne by Owner.

7.0 ARTICLE 7 - CONSTRUCTION ADMINISTRATION

7.1 Review and Approval of Subcontractor Schedules of Values. Contractor shall procure, and carefully review, all schedules of values from each Subcontractor, together with any supporting documentation or data which Owner or Contractor may require from the Subcontractors. The purpose of such review and examination shall be to protect Owner and Contractor from front-end loading and an unbalanced schedule of values which allocates greater value to certain elements of the Work than is indicated by such supporting documentation or data or than is reasonable under the circumstances. If any Subcontractor’s schedule of values is found not to be appropriate, or if the supporting documentation or data is deemed to be inadequate, Contractor shall negotiate with the Subcontractor to establish a balanced schedule of values. After making its review and examination, when the Subcontractor’s schedule of values is found by Contractor to be appropriate as submitted, or if necessary, as revised, Contractor shall sign and deliver same to the Professional Services Consultant thereby indicating Contractor’s informed belief that such schedule of values constitutes a reasonable, balanced basis for payment to the Subcontractor. Contractor shall not sign a Subcontractor’s schedule of values in the absence of such belief unless directed to do so, in writing, by Owner’s Representative.

7.2 Supervision. Contractor shall maintain a continuous presence on the Project site at all times through the provision of sufficient qualified supervisory and other personnel to perform the obligations of this contract. Contractor shall continually supervise its own
forces and those of its Subcontractors in a first-class manner. Contractor shall determine the adequacy of personnel, labor, materials, equipment and direct supervision provided by Subcontractors and shall monitor their compliance with the Construction Schedule. The jobsite superintendent shall be present at the project site in strict accordance with the project specifications, Division 01 00 00 - General Project Requirements. The jobsite superintendent shall not be changed without the consent of the Professional Services Consultant and Owner unless the jobsite superintendent proves to be unsatisfactory to the Contractor and ceases to be in the Contractor's employ. The jobsite superintendent shall be the Contractor's representative at the jobsite and all directions issued by the Professional Services Consultant or Owner to the jobsite superintendent shall be as binding as if given directly to the Contractor. Directions of major importance shall be confirmed in writing to the Contractor. Directions of lesser importance shall be confirmed on written request in each case.

7.3 **Job Progress Meetings.** Contractor shall conduct meetings at least weekly, and at such additional times as the needs of the Project or good construction practice may require, with the Subcontractors, and if necessary with Professional Services Consultant, for the purpose of discussing all matters relating to the quality, quantity, and progress of the Work. Contractor shall within two (2) working days after each meeting prepare and distribute minutes of such meeting to Owner's Representative, the Professional Services Consultant, the participants, and others who should reasonably be informed of the meetings.

7.4 **Requests for Information and Interpretation.** Where appropriate, Contractor shall transmit to Professional Services Consultant, with a copy to Owner's Representative, requests for information or interpretation from itself or as made by any Subcontractor regarding the intent and meaning of the Construction Documents. Contractor shall maintain a log of all requests for information and interpretation (the "Request Log"), recording (a) the date each request was made; (b) the date the request was transmitted to Professional Services Consultant and Owner's Representative; (c) the date of receipt of the response to the request; and, if applicable, (d) the date the response to the request was transmitted to the Subcontractor.

7.5 **Submittals.** Contractor shall review, and indicate its approval (or require re-submission if necessary) prior to forwarding to Professional Services Consultant and Owner each submittal required by the Contract Documents, including shop drawings, product data, samples, catalogues, and other submittals (collectively, "Submittals"). Approval by Contractor of Submittals shall constitute Contractor's representation to Owner and Professional Services Consultant that such Submittals are in conformance with the requirements of the Contract Documents. The review and approval required by this paragraph shall be completed with reasonable promptness, and expedited where necessary, so as to cause no delay to the Subcontractors, Professional Services Consultant, or the Project. Contractor shall also maintain a detailed log (the "Submittal Log"), reflecting: (a) the date, where applicable, the Subcontractors submit to Contractor, and that Contractor submits to Professional Services Consultant, each Submittal; (b) the date of approval or rejection of each Submittal by Contractor or Professional Services Consultant; (c) the reason for the rejection of any Submittal; and (d) the date of each subsequent action by Contractor, Professional Services Consultant, Owner, or Subcontractors with respect to any Submittal. Contractor shall immediately report to Owner's Representative in writing any delays in the Submittal process and the cause thereof and shall take appropriate steps to coordinate and expedite the Submittal process. The Professional Services Consultant's review or approval of Submittals shall not relieve the Contractor from its obligation for performance of the Work in strict compliance with the Contract Documents.

7.6 **Liens.** Contractor shall promptly pay all indebtedness for labor, materials, services, tools and equipment, and for any other items used in the performance of the Work. Contractor
shall not permit any notice of lien or charge to attach to the Work, the premises upon which the Work is being performed or against any public funds being held by the Owner to pay for Work on the Project. If any lien does so attach, Contractor shall promptly procure its discharge and hold Owner harmless from any claims, losses, costs, damages or expenses (including attorney’s fees) incidental thereto.

7.7 Labor Relations. Contractor shall develop and implement a coordinated plan for labor relations to avoid labor disputes and to provide for the uninterrupted and efficient construction of the Project in accordance with the Construction Schedule, shall comply, and shall require all Subcontractors to comply, with Applicable Laws relating to the terms and conditions of employment of any employee who is employed in connection with the Project.

7.8 Protection of Persons and the Work. Contractor shall at all times take, or require to be taken, all necessary steps required to safeguard Owner’s property and employees from injury or loss in connection with the performance of the Work. Contractor shall take, or require to be taken, all necessary steps to protect Owner’s equipment, adjacent facilities, apparatus, and other property and all adjacent Work and property, including, but not limited to, the use of shoring, boarding, and other safeguards. Where the Work endangers the safety of pedestrians and drivers, barricades for traffic shall be used. Contractor shall keep Owner’s property and the Work reasonably free from dampness, dirt, dust, and other damage and shall provide all reasonable security measures necessary to protect the Project from the elements, vandalism, theft, and other risks of property loss. All temporary protections shall be removed by Contractor upon completion of the Work.

7.9 Demolition, Removal of Materials, and Burning. Except with prior written approval of the Owner, the use of explosives will not be permitted. The procedure proposed for the accomplishment of any required demolition work shall be submitted to Professional Services Consultant and Owner’s Representative for approval. The procedure shall provide for safe conduct of the work, careful removal and disposition of materials, protection of property which is to remain undisturbed and coordination with other Work in progress. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations. All materials indicated to be removed shall be disposed of off the Owner’s property. The use of burning at the Project site to dispose of refuse and debris is not permitted.

7.10 Site Limitation. Contractor shall obtain Owner’s Representative’s written authorization before establishing staging or “lay-down” areas.

8.0 ARTICLE 8 - UNCOVERING AND CORRECTING WORK

8.1 Uncovering Work Covered Contrary to Directions. If any of the Work is covered contrary to the request of Owner’s Representative or the Professional Services Consultant, or contrary to any provision of the Contract Documents, said Work shall, if required by Owner’s Representative or the Professional Services Consultant, be uncovered for inspection and shall be properly replaced at Contractor’s expense without change in the Substantial Completion Date.

8.2 Option to Order Work Uncovered. If the Contract Documents permit the Work to be covered and neither Owner’s Representative nor the Professional Services Consultant has requested that the Work not be covered, the Professional Services Consultant and Owner’s Representative may nevertheless require that such Work be uncovered for inspection. If such Work conforms strictly with the Contract Documents, the cost of uncovering and proper replacement shall by Change Order be charged to Owner with an appropriate adjustment to the Contract Sum and, if appropriate, the Substantial Completion Date. If such Work does not strictly conform with the Contract Documents, Contractor shall pay the cost of uncovering and proper replacement without adjustment to the Contract Sum or the Substantial Completion Date.
8.3 **Correction of Defective Work.** Contractor shall immediately proceed to correct Work rejected by Owner's Representative or by the Professional Services Consultant as defective or failing to conform to the Contract Documents, unless such Work is accepted in accordance with paragraph 8.6 below. Contractor shall bear all costs and expenses associated with correcting such rejected Work, including any additional testing and inspections and any fees and expenses of the Professional Services Consultant made necessary thereby, without adjustment to the Contract Sum or the Substantial Completion Date.

8.4 **Correction During One Year Following Completion.** If within one (1) year after Substantial Completion any of the Work is found to be defective or not in strict accordance with the Contract Documents, Contractor shall correct such Work promptly upon receipt of written notice from Owner and shall bear all costs and expenses associated therewith. This obligation shall survive Final Payment by Owner and termination of this contract.

8.5 **No Period of Limitation Established.** Nothing contained in paragraph 8.4 shall establish any period of limitation with respect to Contractor's other obligations and warranties under the contract, including, without limitation, Article 3. Establishment of the one year time period in paragraph 8.4 relates only to Contractor's specific duty to correct the Work.

8.6 **Owner's Option to Accept Defective Work.** Owner may, at its sole discretion, choose to accept defective or nonconforming Work. Such acceptance shall not be effective unless specifically and expressly stated in writing by Owner's Representative. In such event, any sums then or thereafter due or owing to Contractor shall be reduced by the reasonable costs of removing and correcting the defective or nonconforming Work, regardless of whether Final Payment has been made or the defective Work replaced or corrected, the intent being that Owner may use such funds to remedy such defects at a time and in a manner convenient to Owner. If any such sum is insufficient to compensate Owner for the acceptance of defective or nonconforming Work, Contractor shall, upon written demand from Owner, pay Owner any shortfall of compensation for accepting defective or nonconforming Work.

9.0 **ARTICLE 9 - INSPECTIONS AND CERTIFICATIONS OF COMPLETION**

9.1 **Inspection of Work.** Contractor shall, on a continuous basis as a part of its day-to-day supervision of the Project, inspect the Work to ensure that the quality, quantity and progress of the Work meets the requirements of the Contract Documents. In making such inspections, Contractor shall reject Work that is defective or deficient, take steps to avoid unexcused delays in the performance of the Work, and protect Owner from overpayment.

9.2 **Equipment and Other Items.** When instructed by Owner's Representative, Contractor shall schedule and perform factory testing and shop inspections of equipment, fixtures, furnishings, and other items. Such testing and inspections shall be performed at times appropriate to the stage of fabrication, construction, installation, and testing of such items. Contractor shall notify Professional Services Consultant and Owner's Representative prior to each such testing or inspection, and Professional Services Consultant and Owner's Representative or designee shall be entitled, but not required, to accompany Contractor for such testings and inspections.

9.3 **Inspection upon Arrival, During Installation, and After Installation.** Upon arrival of any materials, supplies, systems, equipment, fixtures, furnishings, and other items at the Project site, whether procured by Contractor, Owner, or Professional Services Consultant, Contractor shall inspect such items for damage, for compliance with the Contract Documents and for compliance with all shipping documents and shall arrange for the proper storage and security of such items. Contractor shall also provide for and monitor the proper and timely installation of all such items on the Project. After such items are installed or made ready for use, Contractor shall again inspect all such items...
for damage and shall arrange for and monitor testing of all such items for compliance with
the Contract Documents and readiness for use on the Project.

9.4 Punch Lists. Professional Services Consultant shall prepare punch lists and other
itemizations of defective, deficient, or incomplete Work to be completed by the
Contractor.

9.5 Contractor’s Observation of Testing and Start-Up. Contractor shall schedule (and notify
Professional Services Consultant and Owner’s Representative of such schedule),
coordinate, and observe the testing and start-up of all utilities, systems, fixtures, and
other equipment and shall report the results of same to Professional Services Consultant
and Owner’s Representative in writing.

9.6 Transfer of the Work and the Project to Owner. Contractor shall provide assistance in
the transfer of the completed Project, and all portions thereof, to Owner. Such assistance
shall include procuring certificates of ownership, titles and warranties, keys to the Project,
operations and maintenance manuals and instructions, supplies, start-up of Project
systems, transferring Project security, arranging for training Owner in the operation and
maintenance of all systems and components of the Project, and such other matters as
may relate to Owner's initial occupation, possession, and use of the Project or any part
thereof.

9.7 Certification at Final Completion. When Contractor believes that Final Completion of the
entire Project has been achieved, it shall notify Professional Services Consultant and
Owner’s Representative in writing and request an inspection for certification of Final
Completion of the Project. Contractor's request for final inspection shall constitute a
representation by Contractor to Owner that Contractor has made all inspections of the
Work as provided in the contract and that all the Work has been completed in strict
compliance with the Contract Documents and that the quality of the Work meets or
exceeds the requirements of the Contract Documents.

10.0 ARTICLE 10 - PROJECT DOCUMENTATION

10.1 Basic Project Documentation. Contractor shall maintain the following documents on
behalf of and for the use of Owner: (a) a complete set of current Subcontracts and
Contract Documents, including a current set of drawings, specifications, Change Orders
and modifications reflecting product and materials selections and as-built conditions on
the Project; (b) all shop drawings, samples, product data, and other Submittals; (c) a
clean set of the principal building layout lines, elevations of the bottom of footings, floor
levels, and key site elevations certified by a qualified surveyor or engineer; (d) all
required insurance certificates from Subcontractors; and (e) all other documents required
by this contract.

10.2 Daily Log. Contractor shall maintain a log of daily reports (“Daily Log”) which shall identify
daily weather conditions and any impact on the Work caused thereby, Contractor’s
personnel on site, all Subcontractors working each day and the number of employees of
each on the Project, the Work accomplished each day, any equipment failures or
breakdowns, any procurement or delivery problems, any job site accidents or injuries,
any safety or environmental violations, warnings or citations, and any other events,
circumstances, or occurrences impacting the progress or cost of the Project.

10.3 Monthly Reports. Each month Contractor shall prepare and submit to Owner's
Representative and Professional Services Consultant a written report detailing the
progress of the Project (the "Monthly Report"). The Monthly Report shall contain
Contractor’s estimate of percentage of completion of the Project and each element
thereof, identify any and all delays to the Project and the cause and extent thereof and
describe the remedial measures being taken to overcome such delays, identify any
defective or deficient Work installed during the preceding month and describe the
remedial measures being taken to correct the defective or deficient Work, identify any
outstanding requests for information or clarification, requests for interpretation, change order requests, questions, or other matters requiring the response of either Owner, Contractor, Professional Services Consultant, or a Subcontractor and shall include any and all other information required to fully inform Owner and Professional Services Consultant of the status of the Project and the performance of Contractor, Professional Services Consultant, and Subcontractors.

10.4 Review and Assignment of Warranties. Contractor shall obtain and shall transmit to Owner’s Representative all special products, system, equipment or material warranties required by the Contract Documents and the Subcontracts. Contractor shall review all such warranties to confirm that the warranties are in compliance with the requirements of the Contract Documents and Subcontracts. Contractor hereby assigns to Owner all of Contractor’s rights, title and interest in and to any and all warranties, including Uniform Commercial Code warranties, that Contractor receives or is entitled to receive from any Subcontractor or supplier in connection with the Project.

10.5 Operations and Maintenance Documentation. Contractor shall obtain and transmit to Owner’s Representative all documentation required by the Contract Documents regarding the operation and recommended maintenance programs relating to the various elements of the Project. Such documentation shall be furnished to Owner’s Representative in uniform three-ring binders labeled with the Project name and number.

10.6 Review and Approval of As-Built Drawings. Contractor shall provide as-built drawings and shall confirm to Owner that such drawings are adequate and complete and in compliance with the requirements of the Contract Documents.

10.7 Availability of Project-Related Records to Owner. All records relating directly or indirectly to the Project which are in the possession or control of Contractor shall be made available to Owner, its designee, and any governmental authority for audit, inspection, and copying upon request of Owner’s Representative. Such records include, without limitation: all drawings, specifications, Submittals, subcontractor bids, the Daily Log, correspondence, the Request Log, the Submittal Log, minutes, memoranda, tape or videotape recordings, or other writings or things which document the Project, its design, and its construction.

10.8 Maintenance of Project-Related Records. Contractor shall maintain and protect all Project-related records, other than those required to be returned to Owner, for no less than five (5) years after Final Completion of the Project and for any longer period of time as may be required by law or good construction practice.

10.9 Project Videotapes and Photographs. If at any time requested by Owner’s Representative, Contractor shall, at Owner’s expense, record periodic narrated videotapes or take photographs depicting progress of the Work. Any specific safety or environmental incidents shall be videotaped at the time of the incident without waiting for Owner authorization. All videotapes and photographs shall be submitted to Owner’s Representative on a weekly basis.

11.0 ARTICLE 11 - OWNER’S DUTIES, OBLIGATIONS, AND RESPONSIBILITIES

11.1 Provide Project Information. Owner shall make available to Contractor / Assigned Subcontractor adequate information regarding Owner’s requirements for the Project including adequate complete sets of the Construction Documents. The Contractor / Assigned Subcontractor is responsible for the purchase of these Construction Documents if the desired number of sets exceeds those available from those returned by unsuccessful bidders.

11.2 Review of Documents. Owner shall review any documents submitted by Contractor requiring Owner’s decision and shall render any required decisions pertaining thereto.
11.3 Access to the Site and the Work. Owner shall provide Contractor access to the site and to the Work as necessary for Contractor to perform the requirements of the Contract Documents.

11.4 Timely Performance. Owner shall perform its duties and obligations set forth in this contract in a timely fashion so as to permit the orderly progress of Contractor's Work.

11.5 Owner's Reviews, Inspections, Approvals, and Payments. Owner's review, inspection, or approval of any Work, or any documents prepared or submitted by Contractor shall be solely for the purpose of determining whether such Work and such documents are generally consistent with Owner's construction program and requirements, and Contractor understands that Owner is relying on Contractor to assure compliance with the Contract Documents. No review, inspection, or approval by Owner of such Work or documents shall relieve Contractor of its responsibility for the performance of its obligations under the Contract Documents or for the accuracy, adequacy, fitness, suitability, or coordination of its Work. Approval by any governmental or other regulatory agency or other governing body of any Work, design document, or Subcontract shall not relieve Contractor of responsibility for the performance of its obligations under the Contract Documents. Payment by Owner shall not constitute a waiver of any of Owner's rights under the Contract Documents or at law, and Contractor accepts the risk that defects in the Work, if any, may not be discovered until after payment, including Final Payment, is made by Owner.

11.6 Non-Waiver. Owner's failure to exercise any right or remedy hereunder or to require compliance with any obligation of Contractor under the Contract Documents shall not constitute a waiver or an estoppel of the right to exercise such right or remedy or to insist on such compliance at any other time or on any other occasion.

12.0 ARTICLE 12 - PAYMENT

12.1 Contract Sum. The Contract Sum is stated in the Agreement and, including authorized adjustments and any direct payments to any Assigned Subcontractors, is the total amount payable by the Owner to, and on behalf of, the Contractor for performance of the Work under the Contract Documents.

12.2 Contractor Retainage. Except as otherwise approved by Owner in writing, Owner shall retain ten percent (10%) of the amounts earned under this contract ("Contract Retainage"), and Owner shall not be responsible for releasing, paying or compensating Contractor any amount on account of such Contract Retainage until such time as specified herein for release of Contract Retainage.

12.3 Schedule of Values. Contractor shall prepare and present to the Professional Services Consultant within fifteen (15) days after commencement of the Work, a proposed schedule of values. Contractor’s schedule of values shall be prepared in such form, with such detail, and supported by such data as the Professional Services Consultant or the Owner’s Representative may require to substantiate its accuracy. Contractor shall not front-end load its schedule of values by imbalancing it or by increasing any element thereof in excess of its anticipated actual value, and such acts shall constitute a material breach of this contract. Contractor’s proposed schedule of values shall be used in determining the amounts payable to Contractor and the Assigned Subcontractors hereunder, but only after it has been acknowledged in writing by the Professional Services Consultant and the Owner’s Representative. Schedule of Values and Subcontractors listed will only be accepted if the documentation required by applicable law, including the Illinois Procurement Code (30 ILCS 500/1 et seq.) has been provided to the Owner. See Section 6.4 for the requirements.

12.4 Schedule of Values Shall Identify Subcontractors. The Contractor’s schedule of values shall identify all Subcontractors, vendors, and suppliers with whom a Subcontract or
purchase order in excess of $1,000 is executed or pending in connection with this contract.

12.5 **Reporting MAFBE Participation.** The Contractor's schedule of values shall separately identify all of the proposed Subcontractors, vendors, or suppliers that are certified by the Illinois Department of Central Management Services (CMS) as a Minority or Female Business Enterprise (MBE or FBE) as defined by the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. This information is requested only for the Owner’s use in monitoring the level of MBE/FBE participation on its projects.

12.6 **Applications for Payment.** At least twenty five (25) days before the date established for each payment, the Contractor shall submit to the Professional Services Consultant an itemized Application for Payment for operations completed in accordance with the Contractor’s acknowledged schedule of values. Such application shall be notarized and supported by such data substantiating the Contractor’s right to payment as the Owner or Professional Services Consultant may require, and shall reflect retainage as provided in the Contract Documents.

12.6.A Such applications shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

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

12.6.C The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

12.6.D **Lien Waivers**

12.6.D.1 Partial lien waivers are not required with the first payment application if payment is less than fifty percent (50%) of the contract amount. Each subsequent payment application shall be accompanied by the Contractor’s partial waiver, and by partial waivers from all assigned subcontractor(s), subcontractor(s), vendor(s), and suppliers who were included in the immediately preceding payment application, to the extent of that payment, as reflects on the payment application form.

12.6.D.2 Partial lien waivers from the Contractor and all assigned subcontractor(s), subcontractor(s), vendor(s) and suppliers shall accompany the first payment application when the amount of payment exceeds fifty percent (50%) of the total contract amount.
Lien waivers are to be in the amount reflected on the payment application form.

12.6.D.3 The Contractor’s request for final payment shall include final lien waivers, on Owner forms, from all assigned subcontractor(s), subcontractor(s), vendor(s), and suppliers in the full amount of their contracts as reflected on the payment application form. The Contractor shall also furnish its own final waiver of lien as reflected on the payment application form.

12.7 Certificates for Payment. The Professional Services Consultant will, within seven (7) days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Professional Services Consultant determines is properly due, or notify the Contractor and Owner in writing of the Professional Services Consultant's reasons for withholding certification in whole or in part.

12.8 Decisions to Withhold Certification. The Professional Services Consultant may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner. If the Professional Services Consultant is unable to certify payment in the amount of the Application, the Professional Services Consultant will notify the Contractor and Owner. If the Contractor and Professional Services Consultant cannot agree on a revised amount, the Professional Services Consultant will promptly issue a Certificate for Payment for the amount which the Professional Services Consultant is able to certify. The Professional Services Consultant may withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Professional Services Consultant’s opinion to protect the Owner from loss for which the Contractor is responsible, because of:

12.8.A defective Work not remedied;

12.8.B third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

12.8.C failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

12.8.D reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

12.8.E damage to the Owner or another contractor;

12.8.F reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance will not be adequate to cover applicable damages for the anticipated delay; or

12.8.G persistent failure to carry out the Work in accordance with the Contract Documents.

12.9 Certification of Previously Withheld Amounts. When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

12.10 Partial Payments. The Owner shall make payments for Work performed under the contract as follows:

12.10.A On or about the last day of each month, Owner shall pay to the Contractor and Assigned Subcontractors, that portion of the Contract Sum for which the Professional Services Consultant has issued a Certificate for Payment during such month.
12.10.B Within fifteen (15) days after receipt of any partial payment, the Contractor shall submit to the Professional Services Consultant an affidavit on the Monthly Affidavit Form bound herewith certifying that all debts incurred for Work for which Contractor has been paid have themselves been paid.

12.10.C After the first partial payment, the proper submission by Contractor of such monthly affidavits shall be a condition precedent to future payments.

12.10.D Neither the Owner nor Professional Services Consultant shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

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

12.11 Failure of Payment. If within sixty (60) days after the date established in subparagraph 12.10 for payment and through no fault of the Contractor, the Owner does not pay the Contractor and Assigned Subcontractors the amount certified by the Professional Services Consultant or, if no amount has been certified by the Professional Services Consultant, the amount properly owed to the Contractor and Assigned Subcontractors, then the Contractor may, following the receipt by Owner and Professional Services Consultant and Assigned Subcontractors of sixty (60) additional days' written notice of its intent to do so, suspend the Work until such payment has been received. In the event of such a suspension by the Contractor, the Contractor shall be entitled to (1) its costs of suspension as provided by, and subject to the provisions of paragraph 20.4, and (2) an extension of time as provided by, and subject to the provisions of paragraph 20.5.

12.12 Substantial Completion.

12.12.A When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Professional Services Consultant and the Owner in writing and request an inspection for certification of Substantial Completion. Simultaneously, the Contractor shall prepare and submit to the Professional Services Consultant and Owner a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

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

12.12.C When the Work or designated portion thereof is substantially complete, the Professional Services Consultant will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, and shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of
the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

12.12.D The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment to the Contractor as provided in subparagraph 12.12.E.

12.12.E Payment at Substantial Completion. Provided that all conditions precedent have been satisfied, within thirty (30) days after written acceptance by Owner and Contractor as provided in subparagraph 12.12.D, Owner shall pay Contractor and Assigned Subcontractors all sums due including Contract Retainage, less any amounts attributable to liquidated damages, and less two hundred percent (200%) of the reasonable cost for completing all incomplete Work, correcting and bringing into conformance all defective and nonconforming Work, and handling all unsettled claims. As a further condition precedent to such payment, however, Contractor shall deliver to Owner's Representative the final complete set of as-built drawings in the form of marked-up blueline drawings, all required releases of claim, all certificates of occupancy or similar documents required for the occupation and use of the Project for its intended purposes, all required warranties and all Project Documentation as described in Article 10 herein.

12.13 Partial Occupancy or Use. The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Professional Services Consultant as provided under subparagraph 12.12.A. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Professional Services Consultant. Immediately prior to such partial occupancy or use, the Owner, Contractor and Professional Services Consultant shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

12.14 Final Completion.

12.14.A Written Notice for Final Inspection, Acceptance, and Payment. Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Professional Services Consultant will promptly make such inspection and, when the Professional Services Consultant finds the Work acceptable under the Contract documents and the Contract fully performed, the Professional Services Consultant will promptly issue a final Certificate for Payment.

12.14.B Payment at Final Completion. Provided that all conditions precedent have been satisfied, within thirty (30) days after execution of the final Certificate for Payment, Owner shall pay Contractor and Assigned Subcontractors all unpaid sums due Contractor under this Agreement ("Final Payment"), less any amount properly withheld pursuant to this contract. Contractor's acceptance of Final Payment shall constitute an unconditional waiver and release of all claims by
Contractor for additional compensation beyond that provided in the Final Payment. Final Payment by Owner shall not, however, constitute a waiver by Owner of its rights or claims arising from Contractor's failure to perform the requirements of the Contract Documents.

12.15 Withholding of Payment. Any provision of the Contract Documents notwithstanding, Owner shall not be obligated to make a payment or payments to Contractor or Assigned Subcontractors otherwise due, if, and for so long as, any one or more of the following conditions exist:

12.15.A Contractor's Application for Payment is not in the form or supported by the documentation required by this Contract;

12.15.B Contractor is in default of any of its obligations under the Contract Documents;

12.15.C Any part of such payment is attributable to Work which is defective or not strictly conforming with the requirements of the Contract Documents; provided, however, that payment shall be made as to the part thereof attributable to Work which is rendered or performed in accordance with the Contract Documents and is not defective, subject to other provisions hereof;

12.15.D Contractor has improperly failed to make payments to its Subcontractors, consultants, employees, or others performing Work in connection with the Project or any person has filed a claim that Contractor has failed to make payments due to such person;

12.15.E Any person has asserted a claim against Owner in whole or in part on account of alleged acts or omissions of Contractor;

12.15.F Evidence that the balance of the Work cannot be completed in accordance with the Contract Documents for the unpaid balance of the Contract Sum;

12.15.G Failure or refusal by Contractor to perform the Work in accordance with the Contract Documents;

12.15.H Damage to Owner or to a third party to whom Owner is, or may be, liable; or

12.15.I Any situation or condition exists which, as set forth elsewhere herein or in the Contract Documents, justifies the withholding of payments.

In the event that any of the foregoing conditions exist, Owner shall be entitled to withhold from any sum then due or thereafter to become due, including from retained sums, an amount sufficient in the sole judgment of Owner's Representative to satisfy, discharge, and defend against such claims and to make good any losses, prospective losses, costs, attorney's fees, and other expenses which may result from the existence of such conditions.

12.16 Disputed Payment Applications. In the event Owner's Representative or the Professional Services Consultant disagrees with or questions all or any portion of any Application for Payment, the amount due to Contractor, or the sufficiency of the information and documentation submitted by Contractor, Owner's Representative or the Professional Services Consultant shall notify Contractor in writing and Owner shall pay the undisputed parts of such Application for Payment. If Owner's Representative and Contractor are able to agree on the amount due under the disputed part of any Application for Payment, payment will be made to Contractor within ten (10) days after receipt of a new Application for Payment representing the agreed amount. Pending resolution of any disputed Application for Payment, or other disputes, Contractor shall continue its performance hereunder without interruption.

12.17 Non-Waiver of Claims for Defective Work. Neither entrance, inspection nor use of the Project by Owner, Professional Services Consultant, or their representatives shall be construed as an acceptance of defective or nonconforming Work nor shall such entrance,
inspection or use release Contractor from any of its obligations under the Contract
Documents.

13.0 **ARTICLE 13 - CHANGE ORDERS**

**13.1 Authority to Order Changes.** Owner may by written Change Order, and without affecting
the validity or enforceability of this contract, direct changes in the Work within the general
scope of the Contract Documents, including changes, additions, deletions, modifications,
and revisions thereto. Owner may, at its sole discretion, initially direct changes in the
Work by a Field Directive or Emergency Work Authorization, as defined in this Article and
the Contract Documents. Contractor shall promptly proceed, and cause all
Subcontractors to proceed, with the performance of the Work in accordance with Owner’s
direction, and failure to agree on the terms of a Change Order shall not excuse
Contractor from continued performance of the Work in an expeditious fashion or from
proceeding with any directed change.

**13.2 Adjustments to Contract Sum and Contract Time Only by Change Order.** Changes in the
Contract Sum and extensions of time for the performance of this contract may only be
made by a Change Order issued in accordance with the terms of this Article. Owner shall
not be responsible for any change in the Work involving extra cost unless approval in
writing is furnished by Owner before such Work is begun. Professional Services
Consultant does not have authority to order changes in the Work that involves changes in
cost or time.

**13.3 Adjustments to the Contract Sum.** If there is a change in the Work required of Contractor
under the Contract Documents, which change increases Contractor’s cost of
performance, or if Contractor submits a claim for additional compensation pursuant to
paragraph 14.2, then, subject to Owner’s approval of Contractor’s claim, the Contract
Sum shall be adjusted by a Change Order; provided, however, that no upward
adjustment shall be made if the change in the Work, or the basis of the claim for
additional compensation, is caused by the fault, in whole or in part, of Contractor, a
Subcontractor, or anyone for whom they are, or may be, responsible. If a change in the
Work reduces Contractor’s cost of performance, then the Contract Sum shall be
decreased accordingly. The amount of any adjustment to the Contract Sum shall be
determined by agreement between Owner and Contractor. In the absence of such
agreement, the Contractor, upon receipt of a written order from the Owner, shall
nevertheless promptly proceed to implement the change. In such case, the Contractor
shall keep and present, in such form as the Professional Services Consultant may direct,
a correct account of the resulting job costs or savings, or both, with supporting vouchers.
The Professional Services Consultant, upon determination of the costs or savings from
such account and from any investigation made by it and, after applying the percentages
for overhead and profit provided in the Agreement, shall certify the adjusted Contract
Sum. Such certification shall be binding upon both parties.

For Lump Sum Change Orders, the Contractor will submit a properly itemized Lump Sum
Change Order Proposal covering the additional work and/or the work to be deleted. This
proposal will be itemized for the various components of work and segregated by labor,
material, and equipment in a detailed format satisfactory to Owner. The Owner will
require itemized change orders on all change order proposals related to work to be
performed by the Contractor and all Subcontractors. Details to be submitted will include
detailed line item estimates showing detailed materials quantity take-offs, material prices
by item and related labor hour pricing information and extensions (by line item or by
drawing as applicable).

**13.4 Payment.** Requests for payment for performance of Work pursuant to a Change Order
shall be made in accordance with, and payment shall be subject to, the provisions of
Article 12.
13.5 **Change Orders Final.** The execution of a Change Order by Contractor shall constitute conclusive evidence of Contractor's agreement to the ordered changes in the Work, the Contract Documents as thus amended, the Contract Sum and the Substantial Completion Date. Contractor, by executing the Change Order, waives and forever releases any claim against Owner for additional time or compensation for matters in any manner relating to, arising out of or resulting from the executed Change Order. Any additional Work performed by Contractor or Subcontractors without prior written authorization by Owner shall be performed at the sole risk and expense of Contractor.

13.6 **Field Directives.** In the event of unforeseen circumstances that are beyond the Owner's control as defined in Article 1, Section 1.6, Owner may issue a Field Directive to commence Work. Upon completion of the Work performed under the Field Directive, a Change Order shall be generated in accordance with Article 13 within.

13.7 **Emergency Work Authorization.** In the event of conditions that require immediate action as defined in Article 1, Section 1.5, Owner may issue an Emergency Work Authorization to commence Work. Upon completion of the Work performed under the Emergency Work Authorization, a Change Order shall be generated in accordance with Article 13 herein.

14.0 **ARTICLE 14 - CLAIMS BY CONTRACTOR**

14.1 **Generally.** All claims against Owner shall be initiated by a written notice submitted by Contractor to Owner's Representative and to the Professional Services Consultant. Such notice shall be submitted to, and received by, Owner's Representative and the Professional Services Consultant not later than seven (7) days after the occurrence of the event, or commencement of the condition, giving rise to the claim. Promptly thereafter, Contractor shall submit its documented claim to Owner's Representative and to the Professional Services Consultant and shall make available to both all pertinent information requested by either relating to such claim. Contractor and Owner shall continue their performance under this Agreement regardless of the existence of any claims submitted by Contractor.

14.2 **Claims for Additional Compensation.** In the event Contractor seeks to make a claim for an increase in the Contract Sum, then as a condition precedent to any liability of Owner therefor, Contractor shall strictly comply with all of the requirements of paragraph 14.1 and such claim shall be made by Contractor before proceeding to execute any additional or changed work. Failure to satisfy this condition precedent shall constitute a waiver by Contractor of any claim for additional compensation. Any liability of Owner for additional costs to Contractor shall be limited to actual and reasonable direct costs incurred by Contractor and shall in no event include indirect costs or consequential damages of Contractor or others. Absent a Change Order, Owner shall not be liable to Contractor for claims of third parties, including Subcontractors, unless and until liability of the Contractor has been established therefor in a court of competent jurisdiction. No change in the Contract Sum shall be made except by Change Order issued in accordance with the terms of this contract. Claims by Assigned Subcontractors shall be handled by Contractor the same as claims by other Subcontractors. However, any payments otherwise due and payable to Assigned Subcontractors shall be made directly by the Owner.

14.3 **Claims for Extensions of Time.** In the event the Contractor should be delayed in performing any task which at the time of the delay is then critical, or which during the delay becomes critical, as the sole result of any act or omission by the Owner or someone acting in the Owner's behalf, or by Owner-authorized Change Orders, unusually bad weather not reasonably anticipatable, or Acts of God, the Substantial Completion Date, or as applicable, the date for Final Completion, shall be appropriately adjusted by the Owner upon the written claim of the Contractor to the Owner and the Professional Services Consultant. A task is critical within the meaning of this paragraph
14.3 if, and only if, said task is on the critical path of the Project schedule so that a delay in performing such task will delay the ultimate completion of the Project. As a condition precedent thereto, any claim for an extension of time by the Contractor shall strictly comply with the requirements of paragraph 14.1 above. If the Contractor fails to make such claim as required in this paragraph 14.3, any claim for an extension of time shall be waived.

14.4 **Claims for Concealed or Unknown Conditions.** In the event the Contractor discovers previously concealed and unknown site conditions which are materially at variance from those typically and ordinarily encountered in the general geographical location of the Project, the Contract Sum shall be modified, either upward or downward, upon the written claim made by either party within seven (7) calendar days after the first appearance to such party of the circumstances. As a condition precedent to the Owner having any liability to the Contractor due to concealed and unknown conditions, the Contractor must give the Owner and the Professional Services Consultant written notice of, and an opportunity to observe such condition prior to disturbing it. The failure by the Contractor to give the written notice and make the claim as provided by this paragraph 14.4 shall constitute a waiver by the Contractor of any rights arising out of or relating to such concealed and unknown condition.

14.5 **No Damages for Delay.** The Owner shall not be responsible for damages to any extent whatever to the Contractor for delays in furnishing those materials or performing those acts required under the terms hereof to be furnished or performed by the Owner, Owner's employees, agents or assigns, if such delays are the result of causes beyond the Owner's reasonable control or power to avoid.

15.0 **ARTICLE 15 - PAYMENT AND PERFORMANCE BONDS**
Contractor shall provide separate payment and performance bonds on the forms provided by Owner and issued by a surety, or sureties, acceptable to Owner. The surety companies providing coverage must have a policyholder's rating not lower than "A-" and a financial rating not lower than "VI" in the current edition of Best's Key Rating Guide for property/casualty insurance companies. Each of the bonds shall include a penal sum in the amount of one hundred percent (100%) of the Contract Sum. Contractor's surety(ies) shall be deemed to have waived notice of, and to have consented to, changes to the Contract Documents, including changes in: (a) the time for performing the Work and payment of compensation to Contractor hereunder; (b) the sums payable under this contract to Assigned Subcontractors, if applicable; and (c) the Work to be performed. The Contract Documents shall be incorporated by reference into each of the bonds.

16.0 **ARTICLE 16 - CONTRACTOR'S PERSONNEL AND SUBCONTRACTORS**

16.1 **Personnel.** Contractor shall assign only qualified personnel to perform the Work.

16.2 **Removal of Personnel and Subcontractors.** If, at any time during the course of the Project, Owner's Representative reasonably determines that the performance of any member of Contractor's staff or any of Contractor's Subcontractors including Assigned Subcontractors, or consultants working on the Project is unsatisfactory, Owner's Representative may, in writing, require Contractor to remove such staff member or terminate such Subcontractor or consultant from the Project immediately and replace the staff member, Subcontractor or consultant at no cost to Owner, including those resulting from delay or inefficiency the change may cause.

16.3 **Employment Taxes.** Contractor shall be responsible for payment of all unemployment compensation, social security, and other similar taxes and benefits covering its employees.

17.0 **ARTICLE 17 - OWNERSHIP OF DOCUMENTS**
All Contract Documents, as well as information and items provided by Owner to Contractor to facilitate Contractor's performance hereunder, shall remain the exclusive property of Owner, and
all such documents, information, and items, including all copies thereof, shall be returned to Owner's Representative upon Final Completion and as a condition precedent to Final Payment, provided that Contractor may retain one copy of same for record purposes only.

18.0 **ARTICLE 18 - INDEMNITY AND LIABILITY INSURANCE**

18.1 **Indemnification.** To the fullest extent permitted by law the Contractor agrees to pay and reimburse and indemnify, keep and hold harmless the Owner, its Trustees, officials, agents, employees, servants and their respective heirs, executors, administrators, officers, directors, successors and assigns from and against any and all losses, demands, obligations, costs, damages, liabilities, suits, actions, judgments, claims (including, but not limited to, claims for the infringement of any patents, copyrights, licenses or other intellectual property rights) and expenses, including, but not limited to, attorneys' consultants', and experts' fees and expenses, and including both litigation and pre-litigation expenses, arising out of or connected with: (a) any injury to or death of persons or damage to or loss of destruction of property (other than the Work itself) caused by or attributable to errors or omissions or negligent acts or willful acts, in whole or part, of the Contractor, its sub-consultants, sub-contractors, officers, agents, representatives, or employees; (b) any error, omission, or negligent act; (c) any breach or failure of performance by the Contractor or its sub-consultants, sub-contractors, officers, agents, representatives, or employees under this Agreement. Contractor expressly understands and agrees that any insurance protection required by this Agreement shall in no way limit its responsibilities or liabilities or serve as a limit in recovery.

18.2 **Contractor's Liability Insurance.** The Contractor agrees to maintain the following minimum insurance coverage for the duration of the Project or the term for which services will be rendered, and for as long as necessary thereafter to cover claims with respect to its performance under this Agreement.

18.2.A The Contractor shall cause a Certificate of Insurance to be issued showing the following required coverage in no less than the minimum coverage limits listed below. The insurance companies providing coverage must have a policyholder's rating not lower than "A-" and a financial rating not lower than "VI" in the current edition of Best's Key Rating Guide for property/casualty insurance companies.

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Minimum Limits of Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.2.A.1 Workmen's Compensation and Occupational Diseases Employer's Liability (Part B)</td>
<td>Illinois Statutory Limits</td>
</tr>
<tr>
<td></td>
<td>$500,000 per occurrence</td>
</tr>
<tr>
<td>18.2.A.2 Commercial General Liability</td>
<td></td>
</tr>
<tr>
<td>Each Occurrence</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>General Aggregate</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Products Completed Operation Aggregate</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Personal and Advertising Injury</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Fire Damage</td>
<td>$100,000</td>
</tr>
<tr>
<td>18.2.A.3 Commercial Auto Liability</td>
<td></td>
</tr>
<tr>
<td>Combined Single Limit</td>
<td>$1,000,000 per occurrence</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>Bodily Injury</td>
<td>$1,000,000 per occurrence</td>
</tr>
<tr>
<td>Property Damage</td>
<td>$1,000,000 per occurrence</td>
</tr>
<tr>
<td>18.2.A.4 Evidence of umbrella or excess liability may be used to meet the above required liability limits.</td>
<td></td>
</tr>
</tbody>
</table>
18.2.A.5 Evidence of waiver of subrogation must be expressly stated on the certificate of insurance form (reference section 18.2.A.8.4).

18.2.A.6 Subcontractors must comply with the same underlying insurance coverage requirements as Contractor. Subcontractors shall submit the required Certificate of Insurance to the Contractor.

18.2.A.7 With respect to the required Commercial General Liability insurance, the Certificate of Insurance should include Additional Insured wording that conveys the following: "The Board of Trustees of the University of Illinois, Construction Manager (if applicable), Contractor with assigned subcontractor(s) (if applicable), and additional parties as designated by Owner (if any) shall be named as an additional insured on a primary and non-contributory basis for liability incurred arising from the activities of Contractor or its subconsultants, subcontractors, officers, agents, representatives, or employees performing work on behalf of Contractor."

18.2.A.8 General Liability Terms and Conditions. The Contractor's general liability insurance shall include, without limitation, the following coverages:

18.2.A.8.1 Contractual Liability. Coverage shall cover all contractual obligations which the Contractor has assumed, including the Indemnity Agreement, for the liability limits set forth above. An Owner/Contractor's protective liability policy may be provided in lieu of a commercial general liability policy for the liability limits set forth above.

18.2.A.8.2 Explosion, Collapse and Underground Hazards. Coverage for "XCU" (explosion, collapse and underground) hazards shall be included for the liability limits set forth above.

18.2.A.8.3 Completed Operations Coverage. Completed operations coverage in the liability limits set forth above shall be included for a period of not less than one year after the Substantial Completion date.

18.2.A.8.4 The Contractor's liability insurance policies shall include a waiver of subrogation clause which must be expressly stated on the Certificate of Insurance that conveys the following:

"It is agreed that in no event shall any insurance company of the Contractor have any right of recovery against Owner for any and all damage or loss unless such damage or loss results from the sole gross negligence or willful misconduct of Owner."

18.3 Terms and Conditions
18.3.A Modification or Cancellation. The Contractor’s insurance policies shall be modifiable or cancelable only after written notice has been delivered by Contractor to the Owner by certified or registered mail thirty (30) days in advance of such modification or cancellation.

18.3.B Delivery of Policies. Upon request, the Contractor shall deliver copies of its newly issued or renewal insurance policies to the Owner within ten (10) days following the Owner's request for such copies. Failure to request such copies of new or renewal insurance policies does not relieve the Contractor of its contractual obligation to provide the insurance coverages set forth.

18.3.C Notification of Insurance Carriers. The Contractor shall be responsible for notifying all of its liability insurance carriers of the provisions of this Agreement and for procuring insurance coverage for this contract on a timely basis. The Contractor shall not commence work under this contract until it has obtained all the insurance required under this Article and until certificates of such insurance have been approved by the Owner.

18.3.D Contractor’s Liability. The procuring of the insurance required under this contract shall be considered solely as securing Contractor's obligations or liabilities assumed under the Contract Documents, including, but not limited to, the obligation to indemnify the Owner assumed under paragraph 18.1 and shall not be considered as satisfaction of, or a substitution for, such obligations and liabilities. The Contractor shall remain liable and responsible for all such obligations whether or not the insurance provided by it is approved by the Owner and whether or not such insurance is sufficient in amount, quality or coverage to protect it against such liability. The Contractor shall pay and make good all such obligations to the full extent thereof and to the extent that such insurance does not cover them.

18.3.E Enforcement of this Contract. In the event Owner retains legal counsel to secure performance by Contractor of any of its obligations under this contract, or if Owner retains or utilizes such counsel to represent its interest with respect to any matter for which Contractor has an indemnity obligation to Owner under any provision of this contract or otherwise, Contractor shall pay and reimburse Owner for the cost of such counsel and shall further pay and reimburse Owner for any and all other cost and expense incurred in preparing, negotiating, or prosecuting any claim against Contractor, including, but not limited to, any and all expert witness fees and expenses.

18.3.F Lapse of Insurance. In the event Contractor loses insurance coverage, Contractor shall stop work and shall immediately notify Owner of such cancellation or other loss of insurance coverage. Owner shall withhold any future payments due to Contractor until the matter is resolved. Owner reserves the right to pursue any legal action necessary to cover losses. If Contractor procures replacement insurance in accordance with Contract Documents, Owner reserves the right to allow Contractor to continue work. There shall be no time credit for days not worked pursuant to this section.

18.3.G Uninsured Loss Occurrence. In the event a loss occurs during the uninsured period, Owner reserves the right to withhold payment due to Contractor. Contractor shall immediately notify Owner of any loss. Owner shall withhold any future payments due to Contractor. Owner reserves the right to pursue any legal action necessary to cover losses. If Contractor remedies the loss and obtains the required insurance coverages, Owner reserves the right to allow Contractor to continue work. There shall be no time credit for days not worked pursuant to this section.
18.3.H The Contractor’s failure to comply with any insurance requirements set forth herein shall be deemed a material breach of the contract terms.

18.3.I Contractor shall furnish any original Certificate(s) of Insurance evidencing the required coverage to be in force on the date of this Contract, and any renewal Certificate(s) of Insurance if coverage has an expiration or renewal date occurring during the term of this Contract to the appropriate contact person as designated. The receipt of any certificate does not constitute an admission by the Owner that insurance requirements have been met. Failure of the Owner to obtain certificates or other insurance evidence from the Contractor shall not be deemed a waiver by the Owner.

19.0 **ARTICLE 19 - BUILDER’S RISK INSURANCE**

19.1 **The Owner’s Risk.** Owner bears the risk of loss or damage for Owner-procured equipment while in transit or in storage away from the jobsite until responsibility for the Owner-procured equipment is accepted by a contractor or the property is transferred to the custody of the designated contractor or the custody of any contractor subject to the supervision of the designated contractor, or any contractor named as an additional insured, or named insured, under the Builder’s Risk/Installation Floater (herein after referred to as “Builder’s Risk” or “policy”). The designated contractor is responsible for providing and paying for the builder’s risk insurance as described in Article 19. Any loss or cost of repair not covered by such insurance shall be borne by the Contractor responsible for the Work, without additional cost to the Owner. The entity (Contractors or Construction Managers) responsible for providing Builder’s Risk Insurance, identified in Document 00-10-00 Section 2.0, will hereinafter be known as the Designated Contractor throughout this Article.

19.2 **The Contractor’s Risk.**

19.2.A **Designated Contractor with Assigned Subcontractors.** If Builder’s Risk Insurance is required, the Designated Contractor will provide an insurance policy which shall insure against all risks of direct physical loss or damage to the project. Risk of transit and storage for equipment not Owner-procured is the responsibility of each individual Contractor until such time as the equipment is delivered to the jobsite. The Designated Contractor shall be responsible for the deductible.

19.2.B **Designated Contractor without Assigned Subcontractors or Construction Managers.**

19.2.B.1 If Builder’s Risk Insurance is required and where the Owner has not assigned subcontractors to a Designated Contractor, the Contractor assigned the responsibility of procuring the Builder’s Risk policy will provide an insurance policy that insures against all risks of direct physical loss or damage to the Project. Risk of transit and storage for equipment not Owner-procured is the responsibility of each individual Contractor until such time as the equipment is delivered to the jobsite. Contractors will be responsible for payment of the policy deductible for losses to their portion of the Work. Contractors will be responsible for submitting and negotiating their claims, if any, under the Builder’s Risk policy, and/or for any other coverages that they might procure on their own behalf.

19.2.B.2 **Deductible.** The policy shall be subject to the following deductible schedule, unless a different deductible is approved by the Owner under separate cover:

<table>
<thead>
<tr>
<th>Policy Limit of Builder’s Risk</th>
<th>Maximum Amount of Deductible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to $10,000,000</td>
<td>$ 5,000</td>
</tr>
<tr>
<td>Over $10,000,000</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

Form approved by Legal Counsel - UOCP&RES 11/15
The Owner shall not be responsible for any portion of the deductible.

19.3 **Builder’s Risk Policy.**

19.3.A The policy shall be a Completed Value All Risk Builder’s Risk/Installation Floater form or equivalent form issued under an ISO (hereinafter referred to as “Builder’s Risk” or “policy”) with the policy limit equal to one hundred percent (100%) of the total sum of all Agreements, including the value of Owner-purchased building materials and supplies, equipment, machinery and fixtures intended to become a permanent part of the Project.

19.3.B The policy shall be issued in the name of the Designated Contractor with the Owner (The Board of Trustees of the University of Illinois), all assigns, all contractors, subcontractors of every tier, mortgagees and/or loss payees, if applicable and Professional Services Consultants (limited to their site activities) as additional insureds, as their interests may appear.

19.3.C The insurance companies providing coverage must have a policyholder’s rating not lower than A- and a financial rating not lower than VI in the current edition of Best’s Key Rating Guide.

19.3.D The policy will, at a minimum, comply with the requirements set forth. Further, the policy shall include a waiver of subrogation clause which must be expressly stated on the Evidence of Property form that conveys the following:

“It is agreed that in no event shall any insurance company of the Designated Contractor have any right of recovery against Owner for any and all damage or loss unless such damage or loss results from the sole negligence or willful misconduct of Owner.”

19.3.E Contractor shall furnish Evidence of Property Insurance Form evidencing the required Builder’s Risk coverage to be in force on the start of construction at the jobsite, and any renewals if coverage has an expiration or renewal date occurring during the term of this Agreement.

19.3.F Designated Contractor(s) is responsible for and may carry whatever additional insurance they may deem necessary to protect themselves against hazards or perils not covered by the Builder’s Risk policy. Any loss or cost of repair not covered by the Builder’s Risk insurance shall be borne by the Contractor whose Work or property suffers the loss, without additional cost to the Owner.

19.3.G Required Coverage. Policy shall cover all risks of direct physical loss or damage to **covered property** during the policy term, including where applicable, Flood and Earthquake.

19.3.G.1 **Covered Property** (this may be property of the Insured and/or the property of others for which the Insured has assumed responsibility):

19.3.G.1.1 Property which will become a permanent part of the project. This includes materials, supplies, equipment, machinery, foundations, and underground pipes and wiring; owner supplied materials, equipment, machinery and supplies, the value of which has been included in the total project value. Coverage to include commissioning and testing of equipment and systems including boilers, chillers, pumps and other similar equipment.

19.3.G.1.2 Temporary structures including all scaffolding, construction forms, falsework, shoring, cribbing, fencing,
and temporary buildings at the job site, when the value has been included in the total project value.

19.3.G.1.3 Property while in transit from the time of loading until unloading at the final destination (the job site, a temporary offsite location).

19.3.G.1.4 Property while at any location other than the job site, and on a temporary basis.

19.3.G.2 Required Coverage Extensions. Policy shall additionally cover the following, subject to policy sub-limits sufficient to cover the exposure, which shall be listed in the policy Declarations.

19.3.G.2.1 Occupancy. The policy shall specifically permit and allow for beneficial or partial occupancy prior to substantial completion of the Project and acceptance by the Owner.

19.3.G.2.2 Landscaping. Coverage shall extend to trees, shrubs, plants, lawns or sod to be planted as part of the insured project.

19.3.G.2.3 Extra Expenses. Extra expenses shall cover reasonable and necessary excess costs incurred during the period of repair of the damaged property and include equipment rental, emergency expenses, and other expenses necessarily incurred to reduce loss. Unless Owner requires it Extra Expenses would not include additional interest or debt service expense, business interruption, loss of earnings/income, or other delay in completion.

19.3.G.2.4 Construction Documents. Construction Documents shall cover Plans, Blueprints, Drawings, Models or other such Documents related to the project.

19.3.G.2.5 Debris Removal. In the event of direct physical loss or damage to the covered property the policy shall pay the necessary and reasonable costs: 1) to remove debris, including necessary demolition expenses, and/or 2) cost of cleanup at the insured site.

19.3.G.2.6 Architects and Engineers Fees

19.3.G.2.7 Expediting Expense

19.3.G.2.8 Fire Dept. Service Charges and Fire Protective Equipment Refill

19.3.G.2.9 Ordinance or Law/Demolition and Increased Cost of Construction

19.3.G.2.10 Water Damage. Flood, as defined by the Owner in Article 19.3.G may or may not be required depending on the Project; however, the following Water Damage coverage is always required: back-up of sewers, drains and sumps; weight of snow, ice, sleet; sprinkler leakage; water under the ground surface pressing on, or flowing or seeping through foundations, walls, floors or paved surfaces – basements, whether paved or not; or doors, windows or other openings.
19.3.G.3 **Coverage options** - Owner may, at their option, additionally require these Coverage options:

19.3.G.3.1 Delay in completion. Policy shall cover business income and extra expense (loss of rental income and/or gross earnings including concession and/or merchandise revenue; soft costs such as legal/accounting fees, design professional fees, insurance premiums for extending or renewing coverage, general overhead, etc.) in the event direct physical loss or damage to the covered project results in delay. Limit of coverage shall be $0.00.

19.3.G.3.2 Flood. As defined by the Owner means the overflow of a body of water onto normally dry land. The policy shall include coverage for loss due to Flood as defined above. The limit of liability for this peril must be equal to the completed value or $5,000,000, whichever is less. The deductible for this peril may be as high as $25,000. Loss limitations or higher deductibles do not relieve the Contractor of responsibility for the uninsured portion of the loss.

19.3.G.3.3 Earthquake. The policy shall include coverage for loss due to earth movement, including earth sinking, rising or shifting related to such event: landslide, including any earth sinking, rising or shifting related to such event, and including mine subsidence, whether man-made or not; earth sinking (other than sinkhole collapse), rising or shifting including soil conditions which cause settling, cracking or other disarrangement of foundations or other parts of realty. The limit of liability for this peril must be equal to the completed value or $5,000,000, whichever is less. The deductible for this peril may be as high as $25,000. Loss limitations or higher deductibles do not relieve the Contractor of responsibility for the uninsured portion of the loss.

19.3.H Policy shall not be required to cover these types of property:

19.3.H.1 Machinery, tools, and equipment that will not become a permanent part of the project.

19.3.H.2 Vehicles licensed for road use, aircraft, watercraft, rolling stock.

19.3.H.3 Existing property at the job site; unless required by contract.

19.3.H.4 Money, securities, accounts, bills, stamps, and other similar items; precious metals and/or stones.

19.3.H.5 Water, timber, crops, animals; trees, shrubs, plants, and lawn or sod already existing at the job site.

19.3.H.6 Land, except excavations, grading, backfilling, filling or other movement of land if such Work is part of the project.

19.3.I Acceptable Policy exclusions:

19.3.I.1 War and Military Action, including:

19.3.I.1.1 War, including undeclared or civil war
19.3.I.1.2 Hostile or warlike action by a military force in time of peace or war;

19.3.I.1.3 Insurrection, rebellion, revolution, civil war, usurped power or action taken by governmental authority in hindering, combating, or defending against any of these;

19.3.I.1.4 Seizure or destruction of property by order of governmental authority.

19.3.I.2 Nuclear reaction, nuclear radiation or radioactive contamination from any other cause, however, loss or damage arising out of a resultant fire shall be covered (subject to the provisions of the insurance policy).

19.3.I.3 Mysterious disappearance or shortage found upon taking inventory;

19.3.I.4 Dishonest or criminal acts of the insured or its employees;

19.3.I.5 Seizure or destruction of property by order of any governmental authority; unless such action is ordered to prevent the spread of fire, in which case the policy shall pay for the damage to the covered property.

19.3.I.6 Loss from fungus, mold, mildew, and the like, unless otherwise specified in the insurance policy;

19.3.I.7 Actual, alleged or threatened release, discharge, seepage, escape, or dispersal of Contaminants or Pollutants. However, if fire arises directly or indirectly from the actual release, discharge, seepage, escape or dispersal of Contaminants or Pollutants, any loss or damage insured under the policy arising directly from that fire shall be covered;

19.3.I.8 Asbestos removal per governmental order, plus any additional costs for such things as demolition, or cost of reconstruction or debris removal, arising out of such order.

19.3.I.9 Normal subsidence and/or normal settling, cracking, shrinking or expanding of foundations or any other part of the covered property;

19.3.I.10 Normal wear and tear, gradual deterioration, rust, corrosion, hidden or latent defect or any quality in the property that causes it to damage or destroy itself;

19.3.I.11 Omission or error in planning, zoning, development, surveying, design or specifications;

19.3.I.12 Defective or inadequate workmanship, materials, or maintenance.

19.4 Terms and Conditions

19.4.A Modification or Cancellation. The Designated Contractor's insurance policies shall be modifiable or cancelable only after written notice has been delivered by Designated Contractor to the Owner by certified or registered mail thirty (30) days in advance of such modification or cancellation. Designated Contractor must agree to maintain such insurance for the duration of the Project.

19.4.B Delivery of Policies. Upon request, the Designated Contractor shall deliver copies of its newly issued or renewal insurance policies to the Owner within ten (10) days following the Owner's request for such copies. Failure to request such copies of new or renewal insurance policies does not relieve the Designated
Contractor of its contractual obligation to provide the insurance coverages set forth.

19.4.C Notification of Insurance Carriers. The Designated Contractor shall be responsible for notifying its insurance carriers of the provisions of this Agreement and for procuring insurance coverage for this contract on a timely basis. The Contractor shall not commence work under this contract until it has obtained all the insurance required and until evidence of such insurance has been approved by the Owner.

19.4.D Designated Contractor's Liability. The procuring of the insurance required under this contract shall be considered solely as securing Designated Contractor's obligations or liabilities assumed under the Contract Documents, including, but not limited to, the obligation to indemnify the Owner assumed under paragraph 18.1 and shall not be considered as satisfaction of, or a substitution for, such obligations and liabilities. The Designated Contractor shall remain liable and responsible for all such obligations whether or not the insurance provided by it is approved by the Owner and whether or not such insurance is sufficient in amount, quality or coverage to protect it against such liability. The Designated Contractor shall pay and make good all such obligations to the full extent thereof and to the extent that such insurance does not cover them.

19.4.E Enforcement of this Contract. In the event Owner retains legal counsel to secure performance by Designated Contractor of any of its obligations under this contract, or if Owner retains or utilizes such counsel to represent its interest with respect to any matter for which Contractor has an indemnity obligation to Owner under any provision of this contract or otherwise, Designated Contractor shall pay and reimburse Owner for the cost of such counsel and shall further pay and reimburse Owner for any and all other cost and expense incurred in preparing, negotiating, or prosecuting any claim against Designated Contractor, including, but not limited to, any and all expert witness fees and expenses.

19.4.F Lapse of Insurance. In the event Designated Contractor loses insurance coverage, Contractor shall stop work and shall immediately notify Owner of such cancellation or other loss of insurance coverage. Owner shall withhold any future payments due to Designated Contractor until the matter is resolved. Owner reserves the right to pursue any legal action necessary to cover losses. If Designated Contractor procures replacement insurance in accordance with Contract Documents, Owner reserves the right to allow Designated Contractor to continue work. There shall be no time credit for days not worked pursuant to this section.

19.4.G Uninsured Loss Occurrence. In the event a loss occurs during the uninsured period, Owner reserves the right to withhold payment due to Designated Contractor. Designated Contractor shall immediately notify Owner of any loss. Owner shall withhold any future payments due to Designated Contractor. Owner reserves the right to pursue any legal action necessary to cover losses. If Designated Contractor remedies the loss and obtains the required insurance coverages, Owner reserves the right to allow Designated Contractor to continue work. There shall be no time credit for days not worked pursuant to this section.

20.0 ARTICLE 20 - SUSPENSION

20.1 Suspension of Work. Owner may for any reason suspend, in whole or in part, performance of the Work and Contractor’s performance under this contract. Owner’s Representative shall give written notice of such suspension to Contractor specifying when such suspension is to become effective and the scope of the Work affected by such suspension.
20.2 **Ceasing Performance upon Suspension.** From and upon the effective date of any suspension ordered by Owner, Contractor shall not incur, nor permit any Subcontractor to incur, any further expense or obligations in connection with the suspended portion of the Work. From and upon the effective date of any suspension ordered by Owner, Contractor shall cease performing Work, and shall cause all Subcontractors to cease performing Work, related to the suspended portion of the Work, and shall utilize its best efforts to mitigate costs resulting from the suspension.

20.3 **Resumption of Work after Suspension.** If Owner lifts the suspension it shall do so in writing signed by Owner’s Representative and Contractor shall promptly resume performance of the Work and cause the Subcontractors to resume performance of the Work, unless, prior to receiving the notice to resume, Contractor has exercised its right of termination as provided in paragraph 21.8 herein.

20.4 **Costs of Suspension.** Within seven (7) days after either the resumption of the suspended portion of the Work or the termination of this contract, Contractor shall submit an itemization of the following cost items reasonably and necessarily expended by Contractor as a direct result of the suspension, together with pricing or other data required by Owner’s Representative:

20.4.A salaries of Contractor’s home or branch office employees, or both, but only to the extent that such employees were directly impacted by said suspension;

20.4.B salaries of Contractor’s field employees, costs of construction tools, equipment, and field office costs but only to the extent that such employees were directly impacted by said suspension; and

20.4.C Subcontract costs reasonably and unavoidably incurred on account of the suspension; and

20.4.D any other items directly related to the suspended part of the Work.

Contractor’s failure to provide such itemized information within such seven (7) day time period shall constitute a waiver of any compensation relating to the suspension of Contractor’s Work under this contract. Owner shall promptly review Contractor’s itemization and shall issue a Change Order providing for payment to Contractor of such amounts, and only such amounts, listed above as may be due on account of the suspension and increasing the Contract Sum by like amount. In no event shall Contractor be entitled to lost profits, other consequential damages, or any items of damage related to or resulting from a suspension of the Work except for those items enumerated in this paragraph.

20.5 **Extension of Time Due To Suspension.** In the event that Work is suspended as provided herein, subject to the provisions of paragraph 14.3, Contractor shall be entitled to an equitable time extension as determined by the Professional Services Consultant.

21.0 **ARTICLE 21 - TERMINATION**

21.1 **Termination for Convenience.** Owner may for any reason terminate performance of the Work, this contract, or any part of any of them, for Owner’s convenience. Owner shall give written notice of such termination to Contractor specifying when termination becomes effective and the scope thereof.

21.2 **Ceasing Performance upon Termination.** From and after the effective date of any termination, Contractor shall not incur, nor permit any Subcontractor to incur, any further expense or obligations in connection with the terminated portion of the Work. From and after the effective date of any termination, Contractor shall cease performance and cause the Subcontractors to cease performance, to the extent of the terminated portion of the Work. In the event of termination of this contract, Contractor shall terminate outstanding Subcontracts and purchase orders related to the terminated portion of the Work unless directed to do otherwise by Owner’s Representative. Owner’s Representative may direct
Contractor to assign, and Contractor hereby agrees to assign Contractor's right, title and interest under open or terminated Subcontracts to Owner or its designee. Unless directed otherwise by Owner's Representative, Contractor shall settle the liabilities and claims arising out of the termination of the Subcontracts. If requested by Owner's Representative, Contractor shall vacate the Project site immediately.

21.3 Submission of Termination Invoice. In the event of termination of all or any part of the Work or this contract for convenience, Contractor shall, within ninety (90) days after the effective date of termination, submit a written termination invoice to Owner specifying the amounts due because of the termination together with costs, pricing, and other supporting documentation or data required by Owner's Representative. Contractor's failure to submit a termination invoice within such ninety (90) day period shall constitute a waiver of any compensation relating to the termination. If a proper termination invoice is submitted, then Owner shall pay Contractor an amount derived in accordance with paragraph 21.4 herein.

21.4 Compensation for Termination for Convenience. As full compensation due to Contractor for any termination for convenience, including any amounts due from Contractor to a Subcontractor on account of such termination, Owner shall, subject to subparagraph E. below, pay Contractor the following amounts:

21.4.A Reasonable costs of settling and paying debts arising out of the termination of Subcontracts pursuant to the order of termination;

21.4.B The unpaid portion of overhead and profit earned to the date of termination;

21.4.C If it appears that the Contractor would not have profited, would have sustained a loss, or that its profit would have been diminished if the entire contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any, notwithstanding the provisions of subparagraphs A., B., C., and D. of this paragraph 21.4.

21.4.D The total sum to be paid the Contractor under this paragraph 21.4 shall not exceed the Contract Sum, as properly adjusted, less those sums paid or to be paid directly by Owner to Assigned Subcontractors, reduced by the amounts of payments otherwise made, and shall in no event include duplication of payment.

21.4.E In no event shall Contractor be entitled to recover from Owner, on its own account or on behalf of a Subcontractor, lost profits or other consequential damages, whether its own or those of a Subcontractor, on account of a termination for convenience or an erroneous termination for cause, as described below.

21.5 Termination for Cause. If Contractor refuses or fails to perform under this contract in a timely manner, supply enough properly skilled supervisory personnel, labor or proper equipment or materials, make prompt payment to its Subcontractors, suppliers, employees, or consultants, or comply with Applicable Laws, or if Contractor is otherwise guilty of a material breach of this contract or any warranty made herein, then Owner may, by written notice to Contractor, and without prejudice to any other right or remedy, terminate the employment of Contractor, in whole or in part, and take possession of the Project site, the Contract Documents, Subcontracts, Project Documentation in the possession of Contractor, and all equipment and materials at the site.

21.6 Erroneous Termination for Cause. In the event the employment of Contractor is terminated by Owner for cause and it is subsequently determined by a court or other tribunal of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under paragraph 21.1 and the provisions of paragraph 21.4 regarding compensation shall apply.
21.7 Completion by Owner and Survival of Obligations. Following any termination, whether for convenience or for cause and whether in whole or in part, Owner may complete the terminated portion of the Work by whatever means Owner deems most expedient. Contractor’s obligations and all provisions of this contract shall continue in full force and effect as to all Work performed prior to the effective date of the termination and as to that portion of the Work not affected by the termination.

21.8 Termination by Contractor. If the Work or this contract is suspended by Owner or by governmental authority in its entirety for a period of one hundred and twenty (120) consecutive days or more through no fault of Contractor or the Subcontractors, or if Owner fails to perform its material obligations to the Contractor for a period of sixty (60) days after receipt of written notification from Contractor of its intent to terminate hereunder, then Contractor may, upon seven (7) days written notice to Owner, terminate this contract. In such event, the Contractor shall be entitled to recover from the Owner as though the Owner had terminated the Contractor’s performance for convenience pursuant to paragraph 21.1 above.

22.0 ARTICLE 22 - LABOR AND EMPLOYMENT LAWS AND REGULATIONS

22.1 Illinois Statutes. The Contractor shall comply with all laws, statutes, regulations, ordinances, rulings or enactments of any governmental authority that are applicable to the work or which in any way pertain to the project, including, without limiting the foregoing thereto, the following Illinois statutes:


Pursuant to the Prevailing Wage Act, Contractor shall pay a wage of no less than the general prevailing hourly rate as paid for work of a similar character in the locality in which the work is performed, to all laborers, workers and mechanics, pursuant to definitions, guidelines and procedures set forth in 820 ILCS 130/0.01 et. seq. If the Illinois Department of Labor revises the prevailing rate of hourly wages to be paid by the Owner, the revised rate shall apply to this contract. The prevailing rate of hourly wages is revised by the Illinois Department of Labor and is available on the Illinois Department of Labor’s official website.

The Contractor shall submit monthly to Owner a certified copy of the records required under section 130/5(a)(1) of the Act. The certified payroll shall include records of all laborers, mechanics, and other workers employed by the Contractor, including assigned subcontractors, for services performed. The records shall include each worker’s name, address, telephone number when available, social security number, classification or classifications, hourly wages paid in each pay period, number of hours worked each day, and the starting and ending times of each work day. The certified payroll shall be accompanied by a statement signed by the Contractor and statements signed by each subcontractor where appropriate which aver that: (1) such records are true and accurate, (2) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required under the Act; and (3) the Contractor acknowledges that filing a certified payroll that he or she knows to be false is a Class B misdemeanor.

22.2 Compliance. The above explanations of these Acts are condensed and not intended to be a complete detailed account of all duties and obligations imposed thereby, and hence by this article of The General Conditions, upon the Contractor. The Contractor shall comply with all of the provisions of the above cited Acts, whether herein set forth or not, as well as with the provisions of all other applicable legislation and regulations issued thereunder.

23.0 ARTICLE 23 - RESERVED

24.0 ARTICLE 24 - ENVIRONMENTAL ISSUES
24.1 **Environmental Licenses, Certifications, and Permits.** Contractor covenants and agrees that during the term of this contract and any extensions or renewals thereof, all of its employees, agents, representatives, and Subcontractors, if any, performing Work will have the requisite skills, licenses, certifications, training, permits and the like mandated by all applicable federal, state and local governing authorities with jurisdiction over environmental matters. Contractor agrees to provide to Owner’s Representative evidence of compliance with the requirements of this paragraph upon demand.

24.2 **Environmental Laws.** Contractor, its Subcontractors, representatives, employees, and agents shall comply with all federal, state, and local laws, rules, and ordinances relating to environmental protection governing the Work.

24.3 **Termination.** Contractor agrees that a breach of any of the terms, conditions, and obligations of this Article would be detrimental to Owner, a material breach of this contract and grounds for Owner’s termination of the contract.

24.4 **Application with Other Provisions.** The provisions of this Article 24 shall operate in addition to, and not in limitation of, any other obligations contained in the Contract Documents.

25.0 **ARTICLE 25 - MISCELLANEOUS PROVISIONS**

25.1 **Successors and Assigns.** Subject to the provisions of the Agreement, Owner and Contractor, respectively, bind themselves, their successors, assigns and legal representatives to the other party and to the successors, assigns and legal representatives of such other party with respect to all terms and conditions of this Contract.

25.2 **Third Party Beneficiaries.** Nothing contained herein shall create a contractual relationship with, or any rights in favor of, any third party, including any Subcontractor.

25.3 **Waiver.** No waiver by Owner of any one or more defaults by Contractor in the performance of the provisions of this contract shall be construed as a waiver of any other defaults, whether of a like kind or different nature.

25.4 **Entire Agreement/Amendments in Writing.** This contract represents the entire agreement between Owner and Contractor and supersedes all prior communications, negotiations, representations, or agreements, either written or oral. Subject only to the provisions of Article 13, this contract may be amended only by written instrument signed by both Owner and Contractor.

25.5 **Governing Law.** This Agreement shall be construed, interpreted, and enforced in accordance with the laws of the State of Illinois.

25.6 **“Including”.** The terms “including”, “includes”, and their derivatives are not intended as terms of limitation, and shall be deemed in each instance to be followed by the phrase “without limitation.”

25.7 **Exhibits.** All exhibits annexed hereto are incorporated by reference and made a part of the contract.

25.8 **Headings.** The headings used are merely for convenience and shall have no other force, effect or purpose.

25.9 **Severability.** In the event any provision of this contract shall be held invalid or unenforceable by any court of competent jurisdiction or other competent tribunal or rendered invalid by any legislative or regulatory enactment, the remaining provisions shall remain in full force and effect, and such holding or enactment shall not invalidate or render unenforceable any other provision hereof.

25.10 **Taxes.** The Contractor shall pay all current and applicable city, county, State and Federal taxes, licenses, assessments, including Federal Excise Taxes, due on his work,
including without thereby limiting the foregoing, those required by the Federal Insurance Contributions Act and the Federal and State Unemployment Tax Acts.

The Contractor shall accept exclusive liability for, and pay, all taxes, license fees, assessments, and excises, levied, assessed or imposed upon or on account of the execution of the contract or on the materials therefor, or on the manufacture, storage, sale, receipts from sale, transportation or delivery of the materials therefor, under any Federal, State, or local law or laws, and in the event said taxes, license fees, assessments and excises, or any part thereof, are in the first instance charged to the Owner, the Contractor shall, at the demand of the Owner, pay the Owner the amount thereof, plus any and all penalties which may have accrued thereon.

The Owner is exempted by Section 3-5 of the Illinois Use Tax Act (35 ILCS 105/3-5 (2000)) from paying any of the taxes imposed by that Act, and sales to Owner are exempt by Section 2-5 of the Illinois Retailer's Occupation Tax Act. (35 ILCS 120/2-5 (2000)) from any of the taxes imposed by that Act. The Department of Revenue of the State of Illinois under Rule No. 15, issued August 9, 1961, has declared that sales of materials to construction contractors for conversion into real estate for schools, governmental bodies agencies and instrumentalities, are not taxable retail sales. The Board of Trustees of the University of Illinois has been assigned the following Tax Exemption Number in connection with the Retailers' Occupation Tax, the Service Occupation Tax, the Use Tax, and Service Use Tax in Illinois: E9989-9779-056.

END OF DOCUMENT 00 70 00
1.0 GENERAL NOTE

1.1 Assignment of Section Numbers. 00 90 00 is the CSI Section designated for the control and numbering of addenda and modifications. For purposes of accessibility and control, the documents will be assigned section numbers as shown in the following logs.

1.2 Insertion and Control. Since addenda and modifications are usually issued after the project manual and specifications are assembled and bound, it will not normally be practical to insert copies into this document. It is recommended, however, that the addenda and modifications be posted in the sections of the documents affected and that a complete extra set of the addenda and modifications be kept on file. The following logs for addenda and modifications, bulletins, etc. are provided to assist in the numbering, posting and control of changes to the Contract Documents.

2.0 ADDENDUM LOG

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PROJECT LABOR AGREEMENT
Agreement
Between the
EAST CENTRAL ILLINOIS BUILDING & CONSTRUCTION TRADES COUNCIL
And the
THE UNIVERSITY OF ILLINOIS at URBANA-CHAMPAIGN

1. This Agreement is entered into to facilitate the timely completion of construction and renovation projects at the University of Illinois at Urbana-Champaign (UIUC). The UIUC's academic year schedule, and related student needs, requires the timely completion of projects within precise and limited time parameters. Strikes and other work stoppages could delay the completion of certain projects, disadvantaging UIUC students. Skilled craftsmen are needed by UIUC to achieve the quality of workmanship essential to meeting public expectations and interests. Furthermore, the parties to this Agreement believe it to be in their mutual interest to promote the efficiency of construction operations and provide for peaceful settlement of labor disputes without strikes or lockouts, thereby promoting the public interest in assuring the timely and economical completion of the work. It is also the intent of the parties to set standard working conditions for the efficient performance of work at the UIUC, to establish and maintain harmonious relations between all parties to the Agreement, to secure optimum productivity and to eliminate strikes, lockouts, or delays in the performance of work at UIUC.

2. The UIUC agrees to include the attached Project Labor Agreement (PLA), or mutually agreed successor versions, as part of Advertisements for Bids and Request for proposals on selected construction projects as determined by UIUC.

3. Any firm, union affiliated or not, may bid on the project. Successful bidders must become party to the Project Labor Agreement to be awarded a contract. This Agreement applies only to selected UIUC projects at Champaign-Urbana, Illinois.

4. The East Central Illinois Building & Construction Trades Council (ECIBCTC), its member Unions, agents, affiliates and surrogates agree to not stop, delay, interrupt, strike, picket, harass or interfere in any way with construction projects, contractors, or employees engaged in UIUC projects covered by a PLA. Any interference, whether lawful or not, shall terminate this Agreement.

5. In the event that no qualified bidders bid on a project or portion thereof, UIUC reserves the right to request new proposals without including the Project Labor Agreement.

6. The terms of this agreement is one (1) year beginning January 1, 2015 and ending on December 31, 2015.

7. Neither party to this Agreement shall be obligated to enter into any negotiations for the renewal or extension of this Agreement. If either party desires to renew or extend the Agreement, such party will notify the other party in writing at least ninety (90) days prior to the expiration date.
IN WITNESS WHEREOF, the ECIBCTC and University have caused this Agreement to be executed in their respective capacities effective this day, January 1, 2015.

University of Illinois
Urbana - Champaign
(UIUC)

President

Comptroller

Secretary of Board of Trustees

Associate Vice President for Human Resources

Associate Provost for Human Resources

Executive Director, Facilities & Services

East Central Illinois Building & Construction Trades Council
(ECIBCTC)

President of ECIBCTC

Vice President of ECIBCTC

Sec/Treasurer of ECIBCTC

APPROVED AS TO FORM:

Office of University Counsel

Agreement between UIUC and ECIBCTC – Extended 2015 - 2015
East Central Illinois Building & Construction Trades Council
Project Labor Agreement

This Agreement is entered into this______day of______________ by and between
_____________________________________________ and the East Central Illinois Building and
Construction Trades Council for and on behalf of its affiliates, individually and collectively,
hereinafter referred to as the Union. This Agreement shall apply to work performed by the
Employer and its Contractors and Subcontractors on Construction known as the
__________________________________________hereinafter referred to as the Project.

Article 1 – Intent and Purposes

1.1 It is mutually understood that the following terms and conditions relating to employment of
workmen covered by this Agreement have been written in order to promote efficiency of
construction operations and provide for peaceful settlement of labor disputes without strikes or
lockouts, thereby promoting the public interest in assuring the timely and economical completion of
the work. It is also the intent of the parties to set out standard working conditions for the efficient
prosecution of said construction work, herein to establish and maintain harmonious relations
between all parties of the Agreement, to secure optimum productivity and to eliminate strikes,
lockout, or delays in the prosecution of the work.

(a) Therefore, the following provisions will be binding upon__________________________
and all its sub-contractors (herein jointly referred to as Contractor), who shall be required to
sign the Participation Agreement, attached hereto as Schedule A, and the Unions during the
term of this Agreement and any renewal thereafter. The Unions hereby consent to apply the
terms and conditions of this Project Agreement to said sub-contractors upon their signing the
Participation Agreement. It is understood that each sub-contractor will be considered and
accepted by the Unions as a separate employer for the purposes of collective bargaining. It is
further agreed that the employees working under this Agreement shall constitute a bargaining
unit separate and distinct from all others. This agreement may be modified by mutual consent
in writing by the parties’ signatory hereto.

1.2 The Contractor agrees to be bound by the terms of the Collective Bargaining Agreements and
amendments thereto of the affiliates of the East Central Illinois Building and Construction Trades
Council and the applicable employers association, if any. Such agreements are incorporated herein by
reference, except that the work of the International Union of Elevator Constructors on this Project
shall be performed under the terms of its National Agreements, with the exception of Article XI, XII,
and XIII of this Project Labor Agreement, which shall apply to work. It is mutually understood that
where the provisions of this Agreement are at variance with any other agreement between the
Contractor and the Union, the language of this Agreement shall prevail. In order to comply with the
requirements of the various fringe benefit funds to which the Contractor is to contribute, the
Contractor shall sign such participation agreements when necessary.

1.3 The Contractor and the Union agree that should the collective Bargaining Agreement (CBA)
of any East Central Illinois Building and Construction Trades Council (ECIBCTC) Affiliate signatory
to this Agreement will expire prior to the completion of this project, the expired contracts’ terms will
be maintained until a new CBA is ratified. The wages and fringe benefits included in any new CBA
will be effective on the effective date of the newly negotiated CBA unless wage and fringe benefit
retroactivity is agreed upon by both bargaining parties.

Article 2 - Recognition

2.1 The Contractor recognizes the ECIBCTC and the signatory affiliates as the sole and exclusive bargaining representatives for its craft employees employed on the jobsite. ECIBCTC affiliates signatory to this Agreement will have recognition on the project for their craft.

Article 3 – Administration of Agreement

3.1 In order to assure that all parties have a clear understanding of the Agreement, to promote harmony and address potential problems, a pre-job conference will be held with the Contractor, ECIBCTC Representatives and all signatory parties prior to the start of any work on the project.

3.2 Representatives of the Contractor, the University, or the ECIBCTC may at any time require a meeting to review the operation of this Agreement. Said meeting shall take place within one week of the written request. The representatives at this meeting shall be empowered to resolve any dispute over the intent and application of the Agreement.

3.3 The Contractor shall make available in writing to the ECIBCTC no less than two days prior to these meetings, a job status report, planned activities for the next 30 day period, actual number of craft employees on the project and estimated numbers of employees by craft required for the next 30 day period. The purpose of this report is to allow time to address any potential jurisdictional problems and to ensure that no party signatory to the Agreement is hindering the continuous progress of the project through a lack of planning or shortage of manpower.

Article 4 – Hours of Work Overtime Shifts and Holidays

4.1 The standard work day shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time, which is to be established at the pre-job conference, will be applicable to all craft employees on the project. Should job conditions dictate a change in the established starting time and/or a staggered lunch period on certain work of the project or with individual crafts, the Contractor, Business Managers of the crafts involved and the ECIBCTC shall mutually agree to such changes. If work schedule change cannot be mutually agreed to between these parties, the hours fixed in the Agreement shall prevail.

4.2 All time before and after the established workday of eight (8) hours, Monday through Friday
and all the time on Saturday shall be paid in accordance with each craft's current Collective Bargaining Agreement. All time on Sundays and Holidays shall be paid for at the rate of double time.

(a) Fringe benefit payments for all overtime work shall be paid in accordance with each craft's Current Collective Bargaining Agreement.

4.3 Shifts may be established when considered necessary by the Contractor. Shift pay shall be in accordance with each craft's current Collective Bargaining Agreement.

(a) Shifts when established shall continue for a minimum of five (5) consecutive days.

4.4 Recognized Holidays shall be as follows: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day. No work will be performed on Labor Day under any consideration, except in an extreme emergency and then only after consent has been given by the Business Manager.

Article 5 - Absenteeism

5.1 The Contractor and the Union agree that chronic and/or unexcused absenteeism is undesirable and must be controlled. Employees that develop a record of such absenteeism shall be identified by the Contractor to the appropriate referral facility and the Contractor shall support such action with the work record of the involved employee. Any employee terminated for such absenteeism shall not be eligible for rehire on the project for a period of no less than ninety (90) days.

Article 6 - Management Rights

6.1 The Contractor retains and shall exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this Agreement.

Article 7 - General Working Conditions

7.1 Employment begins and ends at the project site.

7.2 Employees shall be at their place of work at the starting time and shall remain at their place of work until quitting time. The parties reaffirm their policy of a fair days work for a fair days pay.
7.3 The Contractor may utilize brassing, time clocks or other systems to check employees in and out. Should such procedures be required, the techniques and rules regarding such procedures shall be established by mutual consent of the parties at the pre-job conference.

7.4 There shall be no limit on production by workmen or restrictions on the full use of tools or equipment. Craftsmen using tools shall perform any work of the trades and shall work under the direction of the craft foreman. There shall be no restrictions on efficient use of manpower other than as may be required by safety regulations.

7.5 Crew Foreman shall be utilized as per the existing collective bargaining agreements. The Contractor agrees to allow crew Foreman ample time to direct and supervise their crew. The Union agrees there will be no restrictions placed on crew foremen’s ability to handle tools and materials.

7.6 The Contractor may utilize the most efficient methods or techniques of construction tools or other labor saving devices to accomplish the work.
7.7 The Contractor may establish such reasonable project rules as the contractor deems appropriate. These rules will be reviewed and established at the pre-job conference and posted at the project site by the contractor.

7.8 It is recognized that specialized or unusual equipment may be installed on the project and in such cases, the Union recognizes the right of the Contractor to involve the equipment supplier or vendor's personnel in supervising the setting of the equipment. These personnel may make modifications and final alignment which may be necessary prior to and during the start-up procedure, in order to protect factory warranties.

7.9 In order to promote a harmonious relationship between the equipment or vendor’s personnel and the Building Trades craftsmen, a meeting shall be held between the Contractor and the ECIBCTC prior to any involvement on the project by these personnel. The Contractor will inform the ECIBCTC of the nature of involvement by these personnel and the numbers of personnel to be involved, allowing ample time for the Union representatives to inform their stewards prior to the start of any work.

7.10 Equipment or material delivered to the job site will be unloaded promptly without regard to jurisdictional disputes which will be handled as per the provisions of this Agreement. The Contractor will supply ECIBCTC and affiliated unions with delivery schedules, allowing as much time as possible to ensure the appropriate crafts will be available to unload the materials or equipment.

**Article 8 - Safety**

8.1 The employees covered by the terms of this Agreement shall at all times while in the employ of the Contractor be bound by the safety rules and regulations as established by
the Contractor in accordance with the Construction Safety Act and OSHA.

(a) These rules and regulations will be published and posted at conspicuous places throughout the project.

8.2 In accordance with the requirements of OSHA, it shall be the exclusive responsibility of each Contractor on a jobsite to which this Agreement applies, to assure safe working conditions for its employees and compliance by them with any safety rules contained herein or established by the Contractor. Nothing in this Agreement will make the ECIBCTC or any of its affiliates liable to any employees or to other persons in the event that injury or accident occurs.

Article 9 - Subcontracting

9.1 The Project Contractor agrees neither it nor any of its contractors or subcontractors will subcontract any work to be done on the Project except to a person, firm or corporation who is or agrees to become party to this Agreement. Any contractor or subcontractor working on the Project, shall, as a condition to working on said Project, become signatory to and perform all work under the terms of this Agreement. The furnishing of materials, supplies or equipment and the delivery thereof shall in no case be considered subcontracting, with the exception of ready mix, aggregate, asphalts, brick, block, drywall, and trash removal.

Article 10 - Union Representation

10.1 Authorized representatives of the ECIBCTC and its signatory affiliates shall have access to the project provided they do not interfere with the work of the employees and further provided that such representatives fully comply with the visitor and security rules established for the project.

10.2 Each ECIBCTC affiliate, which is a party to this Agreement, shall have the right to designate a working journeyman as a steward. Such designated steward shall be a qualified worker performing the work of that craft and shall not exercise any supervisory functions. Each steward shall be concerned with the employees of the steward’s employer and not with the employees of any other employer.

10.3 The working steward will be paid at the applicable wage rate for the job classification in which he is employed.

10.4 The working steward shall not be discriminated against because of his activities in performing his duties as steward, and except as otherwise provided in local agreements, shall be the last employee in his craft to be laid off in any reduction in force. Stewards will be subject to discharge to the same extent that other employees are only after notification to the Union Representative. The Contractor will permit stewards sufficient time to perform the
duties inherent to a steward’s responsibilities. Stewards will be offered available overtime work if qualified.

**Article 11 - Work Stoppages and Lockouts**

11.1 During the term of this Agreement there shall be no strikes, picketing, work stoppages, slowdowns or other disruptive activity for any reason by the ECIBCTC, its affiliates or by any employee and there shall be no lockout by the Contractor. Failure of any Union or employee to cross any picket line established at the project site is a violation of this Article.

11.2 The ECIBCTC and its affiliates shall not sanction, aid or abet, encourage or continue any work stoppages, picketing or other disruptive activity and will not make any attempt of any kind to dissuade others from making deliveries to or performing services for or otherwise doing business with the Contractor at the project site. Should any of these prohibited activities occur the Union will take the necessary action to end such prohibited activities.

11.3 No employee shall engage in any activities which violate this Article. Any employee who participates in or encourages any activities which interfere with the normal operation of the project shall be subject to disciplinary action, including discharge, and if justifiably discharged for the above reasons, shall not be eligible for rehire on the same project for a period of not less than ninety (90) days.

11.4 Neither the ECIBCTC nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the ECIBCTC will immediately instruct order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The ECIBCTC in its compliance with this obligation shall not be liable for unauthorized acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its right in any instance shall not be deemed a waiver of its right in any other instance.

11.5 In lieu of any action at law or equity, any party shall institute the following procedure when a breach of this Article is alleged; after all involved parties have been notified.

(a) The party invoking this procedure shall notify an individual to be *mutually agreed* upon; whom the parties agree shall be the permanent arbitrator under this procedure. In the event the permanent arbitrator is unavailable at any time, he shall appoint his alternate. Notice to the arbitrator shall be by the most expeditious means available, with notice by service with delivery confirmation to the party alleged to be in violation and all involved parties.

(b) Upon receipt of said notice the arbitrator named above shall set and hold a
hearing within twenty-four (24) hours if it is contended the violation still exist but not before twenty-four (24) after the service with delivery confirmation notice to all parties involved as required above.

(c) The Arbitrator shall notify the parties by service with delivery confirmation of the place and time he has chosen for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Arbitrator.

(d) The sole issue at the hearing shall be whether or not a violation of this Article has in fact occurred. The Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without an Opinion. If any party desires an Opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

(e) Such Award may be enforced by any court of competent jurisdiction upon the filing of the Agreement and all other relevant documents referred to herein above in the following manner. Written notice by service with delivery confirmation of the filing of such enforcement proceedings shall be given to the other party. In the proceeding to obtain a temporary order enforcing the Arbitrator's Award as issued under Section 13.5 of this Article, all parties waive the right to a hearing and agree that such proceedings may be exparte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by service with delivery confirmation.

(f) Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.

(g) The fees and expenses of the Arbitrator shall be borne by the party or parties found in violation. In the event that no violation is found, such fees and expenses shall be borne by the moving party.

Article 12 - Disputes and Grievances

12.1 This Agreement is intended to provide close cooperation between management and labor. Each of the Unions will assign a representative to this Project for the purpose of completing the construction of the Project economically, efficiently, continuously, and without interruption, delays, or work stoppages.
12.2 The Contractors, Unions, and the employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of the work of the project, and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in this Article, accept when any craft which has a no strike, no lockout grievance procedure which results in final and binding arbitration, then they shall use their local grievance procedures to settle such disputes.

12.3 Any questions or dispute arising out of and during the term of this Project Agreement (other than Trade jurisdictional disputes) shall be considered a grievance and subject to resolution under the following procedures:

   Step 1: (a) When any employee subject to the provisions of the Agreement feels he or she is aggrieved by a violation of this Agreement, he or she, through his or her local union business representative or job steward, shall, within five (5) working days after the occurrence of the violation, give notice to the work-site representative of the involved Contractor stating the provision(s) alleged to have been violated. The business representative of the local union or the job steward and the work-site representative of the involved Contractor and the Project Contractor shall meet and endeavor to adjust the matter within three (3) working days after timely notice has been given. The representative of the Contractor shall keep the meeting minutes and shall respond to the Union representative in writing (copying the Project Contractor) at the conclusion of the meeting but not later than twenty-four (24) hours thereafter. If they fail to resolve the matter within the prescribed period, the grieving party may, within forty-eight (48) hours thereafter, pursue Step 2 of the Grievance Procedure, provided the grievance is reduced to writing, setting forth the relevant information concerning the alleged grievance, including a short description thereof, the date on which the grievance occurred, and the provision(s) of the Agreement alleged to have been violated.

   (b) Should the Local Union(s) or the Project Contractor or any Contractor have a dispute with the other party and, if after conferring, a settlement is not reached within three (3) working days, the dispute may be reduced to writing and proceed to Step 2 in the same manner as outlined herein for the adjustment of an employee complaint.

   Step 2: The International Union Representative and the involved Contractor shall meet within seven (7) working days of the referral of a dispute to this second step to arrive at a satisfactory settlement thereof. Meeting minutes shall be kept by the Contractor. If the parties fail to reach an agreement, the dispute may be appealed in writing in accordance with the provisions of Step 3 within seven (7) calendar days thereafter.

   Step 3: (a) If the grievance has been submitted but not adjusted under Step 2, either party may request in writing, within seven (7) calendar days thereafter, that the grievance be submitted to an Arbitrator mutually agreed upon by them. The Contractor and the involved Union shall attempt mutually to select an Arbitrator, but if they are unable to do so, they shall request the American Arbitration Association to provide them with a list of arbitrators from which the Arbitrator shall be selected. The rules of the American Arbitration Association shall govern the conduct of the arbitration hearing. The decision of the Arbitrator shall be final and binding on all parties, the fee and expenses of the
arbitrator shall be borne equally between the Contractor and the involved Local Union(s).

(b) Failure of the grieving party to adhere to the time limits established herein shall render the grievance null and void. The time limits established herein may be extended only by written consent of the parties involved at the particular step where the extension is agreed upon. The Arbitrator shall have the authority to make decisions only on issues presented to him or her, and he or she shall not have the authority to change, amend, add to or detract from any of the provisions of this Agreement.

11.4 The Project Contractor and Owner shall be notified of all actions at Steps 2 and 3 and shall, upon their request, be permitted to participate in all proceedings at these steps.

Article 13 - Jurisdictional Disputes

13.1 As used in this Agreement, the term "jurisdictional dispute" shall be defined as any dispute, difference or disagreement involving the assignment of particular work to one class or craft of employees rather than to a different class or craft of employees, regardless of that Contractor's contractual relationship to any other employer, contractor or organization on the site.

13.2 It is agreed by and between the parties to this Agreement that any and all jurisdictional disputes shall be resolved in the following manner; each of the steps hereinafter listed shall be initiated by the parties in sequence as set forth:

(a) Negotiation by and between the Local Business Representative of the disputing Unions and Contractor assigning the work within 5 business days. Such negotiation shall be pursued until it is apparent that the dispute cannot be resolved at the local level.

(b) The International Representatives of the disputing Union shall meet on the job site by phone conference, e-mail or fax and attempt to resolve said dispute within 5 business days.

(c) The parties to the Jurisdictional Dispute shall submit the dispute directly to an agreed upon arbitrator after complying with paragraph (2b) above within 5 business days. An arbitrator will be selected from a panel of seven (7) arbitrators supplied through the Federal Mediation and Conciliation Service being selected or rejected one at-a-time by the Unions involved. The arbitrator's decision will be final and legally binding on this project only. Further, the losing party(s) will be responsible for the cost of the Arbitrator.

(d) A jurisdictional dispute may be submitted upon a pre-job assignment.

(e) If any party to the jurisdictional dispute does not fully comply with the steps and time limit with each step, then the party in non-compliance will lose by "automatic default".

(f) Time limits at any step can be extended if all parties to the jurisdiction mutually agree in
writing.

(g) All parties to a jurisdictional dispute can mutually agree to waive the time limits in steps 12.2(a) & 12.2(b) and proceed directly to an expedited arbitration hearing.

13.3 The signatory parties to this Agreement agree that all jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage or slow-down of any nature, and the Contractor's assignment shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge

Article 14 - General Savings Clause

14.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by any competent authority of the executive, legislative, judicial or administrative branch of the Federal or State government, the Employer and the Union shall suspend the operation of such Article and provisions during the period of its invalidity and shall substitute by mutual consent, in its place and stead, an Article or provision which will meet the objections to its validity and which will be in accord with the intent and purpose of the Article or provision in question.

Article 15 - Term Of Agreement

15.1 This Agreement shall be in full force as of and from the date shown above to and including the end of all construction by the Contractor.
Signatures for the Unions:

Asbestos Workers LU #18  Date  Ironworkers LU #380  Date
International Association of Heat and Frost Insulators

Bricklayers & Tilesetters LU #8  Date  Laborers LU #703  Date
International Union of Bricklayers & Allied Craftworkers

Bricklayers & Tilesetters LU #8  Date  Laborers' International Union of North America Laborers
International Union of Bricklayers & Allied Craftworkers

Boilermakers LU #60  Date  Millwrights LU #1051  Date
International Brotherhood of Boilermakers, Ironship Builders, Blacksmiths, Forgers and Helpers

United Brotherhood of Carpenters & Joiners of America of Mid Central Illinois Regional Council

Carpenters LU #129  Date  Operating Engineers LU #841  Date
United Brotherhood of Carpenters & Joiners of America of Mid Central Illinois Regional Council

International Unions of Operating Engineers

Electricians LU #601  Date  Painters LU #363  Date
International Union of Electrical Workers

International Brotherhood of Painters & Allied Trades

Glaziers LU #1168  Date  Plasterers & Cement Masons LU #143  Date
International Brotherhood of Painters & Allied Trades

Operative Plasterers & Cement Masons' International Association of the United States and Canada

Page 11 of 19
Signatures for the Unions:

Plumbers & Steamfitters LU #149  Date  
United Association of Journeymen & Apprentices of the Plumbing & Pipe Fitting Industry of the United States & Canada  
12/12/14  

Sheet Metal Workers LU #218  Date  
Sheet Metal Workers International Association  

Road Sprinkler Fitters LU #669  Date  
United Association of Journeymen & Apprentices of the Plumbing & Pipe Fitting Industry of the United States & Canada  
12/12/14  

Teamsters LU #26  Date  
International Brotherhood of Teamsters  

C. James Hailey  Date  
Roofers LU #97  
12/9/2014
## ADDENDUM A: UNION CONTACT LIST

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<thead>
<tr>
<th>Boilermakers LU #60</th>
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<tr>
<td>Cooper, Kirk W.</td>
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<tr>
<td>Company: Boilermakers LU #60</td>
<td>Company: Carpenters LU #44</td>
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<tr>
<td>Full Name: Kirk W. Cooper</td>
<td>Full Name: Randy Johnson</td>
</tr>
<tr>
<td>Job Title: Asst. Business Manager</td>
<td>Job Title: Business Agent</td>
</tr>
<tr>
<td>425 W. Edgewood Court</td>
<td>402 S. Duncan Road</td>
</tr>
<tr>
<td>Morton, IL 61550 – 2497</td>
<td>P.O. Box 7170</td>
</tr>
<tr>
<td>Business Phone: (309) 266-7144</td>
<td>Champaign, IL 61826 -7170</td>
</tr>
<tr>
<td>Business Fax: (309) 266-7539</td>
<td>Business Phone : (217) 356-5463</td>
</tr>
<tr>
<td>Mobile Phone: (309) 339-9815</td>
<td>Business Fax: (217) 356-2981</td>
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<tr>
<td>Web Page: <a href="http://www.teamclmc.org">http://www.teamclmc.org</a></td>
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<tr>
<td>Email: <a href="mailto:kcooper@boilermakers60.org">kcooper@boilermakers60.org</a></td>
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<td>Anderson, Chad</td>
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<tr>
<td>Full Name: Gary L. Husk</td>
<td>Full Name: Chad Anderson</td>
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<tr>
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<td>Job Title: Business Representative</td>
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<tr>
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<tr>
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<td>Business Phone: (217) 356-9114</td>
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<td>Mobile Phone: (618) 718-9538</td>
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<td>Email: <a href="mailto:PaintersLocal363@comcast.net">PaintersLocal363@comcast.net</a></td>
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<td>Nelsen, Matthew D.</td>
<td>Collier, Scott</td>
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<tr>
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<td>Company: Heat &amp; Frost Insulators LU #18</td>
</tr>
<tr>
<td>Full Name: Matthew D. Nelsen</td>
<td>Full Name: Scott Collier</td>
</tr>
<tr>
<td>Job Title: President/Asst. Business Manager</td>
<td>Job Title: Business Manager</td>
</tr>
<tr>
<td>425 W. Edgewood Court</td>
<td>3302 S. East Street.</td>
</tr>
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<td>Morton, IL 61550-2497</td>
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<td>Business Phone: (317) 786-3216</td>
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<td>Business Fax: (309) 266-7539</td>
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</tr>
<tr>
<td>Mobile Phone: (309) 339-9680</td>
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<td>Web Page: <a href="http://www.teamclmc.org">http://www.teamclmc.org</a></td>
<td>Email: <a href="mailto:scott.collier18@yahoo.com">scott.collier18@yahoo.com</a></td>
</tr>
<tr>
<td>Email: <a href="mailto:mnelsen@boilermakers60.org">mnelsen@boilermakers60.org</a></td>
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Bricklayers & Tile Setters LU #8
McCall, Daniel

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Page 14 of 19
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Chad Anderson

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Mozingo, Jeff

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Champion, Bob

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Form approved by Legal Counsel - UOCP&RES 11/15
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Langendorf, Matt

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Bates, Keith

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Cross, Jim

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Donovan, Tim

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Business Fax: (217) 359-4722
Mobile Phone: (217) 493-6020
Email: roofersb97@yahoo.com
# Project Name and Contractor Signature Page

**Project Name**

IN WITNESS WHEREOF, the ECIBCTC and CONTRACTOR have executed this Project Labor Agreement on the ______________ day of ____________________, 20__.

**Contractor Signature**

---

**Print Name**

---

**Title**

---

**Company Name**

---

**Address**

---

**City, State, Zipcode**

---

**Phone**

---

**Fax**

---

**Email**

---

**Website**

---

**East Central Illinois Building & Construction Trades Council (ECIBCTC)**

---

**ECIBCTC President by resolution and authority of the signatory trade unions of the Project Labor Agreement**

- Asbestos Workers LU#18
- Bricklayers & Tilesetters LU#18
- Boilermakers LU#60
- Carpenters LU#44
- Electricians LU#601
- Glaziers LU#1168
- Ironworkers LU#380
- Laborers LU#703
- Millwrights LU#1051
- Operating Engineers LU#841
- Painters LU#363
- Plasterers & Cement Masons LU#143
- Plumbers & Steamfitters LU#149
- Road Sprinkler Fitters LU#669
- Roofers LU#97
- Sheet Metal Workers LU#218
- Teamsters LU#26
Participation Agreement

The undersigned Project Contractor, Contractor or subcontractor, subcontracting to

agrees to be bound to the attached

Project Agreement negotiated between ___________________________ and the

Project Contractor, Contractor, Subcontractor

By

Date
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Legend:  RG (Region) TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers) C (Class) Base (Base Wage Rate) FRMAN (Foreman Rate) M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri. OSA (Overtime (OT) is required for every hour worked on Saturday) OSH (Overtime is required for every hour worked on Sunday and Holidays) H/W (Health & Welfare Insurance) Pensn (Pension) Vac (Vacation) Trng (Training)

Explanations

CHAMPAIGN COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

Oil and chip resealing (O&C) means the application of road oils and liquid asphalt to coat an existing road surface, followed by application of aggregate chips or gravel to coated surface, and subsequent rolling of material to seal the surface.

EXPLANATION OF CLASSES
ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER, MARBLE FINISHER, TERRAZZO FINISHER

Assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments required to complete the proper installation of the work covered by said crafts. The term "Ceramic" is used for naming the classification only and is in no way a limitation of the product handled. Ceramic takes into consideration most hard tiles.

ELECTRONIC SYSTEMS TECHNICIAN

Installation, service and maintenance of low-voltage systems which utilizes the transmission and/or transference of voice, sound, vision, or digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background/foreground music, intercom and telephone interconnect, field programming, inventory control systems, microwave transmission, multi-media, multiplex, radio page, school, intercom and sound burglar alarms and low voltage master clock systems.

Excluded from this classification are energy management systems, life safety systems, supervisory controls and data acquisition systems not intrinsic with the above listed systems, fire alarm systems, nurse call systems and raceways exceeding fifteen feet in length.

SURVEY WORKER - Operated survey equipment including data collectors, G.P.S. and robotic instruments, as well as conventional levels and transits.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION Class 1. Drivers on 2 axle trucks hauling less than 9 ton. Air compressor and welding machines and brooms, including those pulled by separate units, truck driver helpers, warehouse employees, mechanic helpers, greasers and tiremen, pickup trucks when hauling materials, tools, or workers to and from and on-the-job site, and fork lifts up to 6,000 lb. capacity.

Class 2. Two or three axle trucks hauling more than 9 ton but hauling less than 16 ton. A-frame winch trucks, hydrolift trucks, vactor trucks or similar equipment when used for
transportation purposes. Fork lifts over 6,000 lb. capacity, winch trucks, four axle combination units, and ticket writers.

Class 3. Two, three or four axle trucks hauling 16 ton or more. Drivers on water pulls, articulated dump trucks, mechanics and working forepersons, and dispatchers. Five axle or more combination units.

Class 4. Low Boy and Oil Distributors.

Class 5. Drivers who require special protective clothing while employed on hazardous waste work.

TRUCK DRIVER - OIL AND CHIP RESEALING ONLY.

This shall encompass laborers, workers and mechanics who drive contractor or subcontractor owned, leased, or hired pickup, dump, service, or oil distributor trucks. The work includes transporting materials and equipment (including but not limited to, oils, aggregate supplies, parts, machinery and tools) to or from the job site; distributing oil or liquid asphalt and aggregate; stock piling material when in connection with the actual oil and chip contract. The Truck Driver (Oil & Chip Resealing) wage classification does not include supplier delivered materials.

OPERATING ENGINEERS - BUILDING, HEAVY AND HIGHWAY
CONSTRUCTION Class 1. Draglines, Derricks, Shovels, Gradalls, Mechanics, Tractor Highlift, Tournadozer, Concrete Mixers with Skip, Tournamixer, Two Drum Machine, One Drum Hoist with Tower or Boom, Cableways, Tower Machines, Motor Patrol, Boom Tractor, Boom or Winch Truck, Winch or Hydraulic Boom Truck, Tournapull, Tractor Operating Scoops, Bulldozer, Push Tractor, Asphalt Planer, Finishing Machine on Asphalt, Large Rollers on Earth, Rollers on Asphalt Mix, Ross Carrier or similar Machine, Gravel Processing Machine, Asphalt Plant Engineer, Paver Operator, Dredging Equipment, or Dredge Engineer, or Dredge Operator, Central Mix Plant Engineer, CMI or similar type machine, Concrete Pump, Truck or Skid Mounted, Engineer or Rock Crusher Plant, Concrete Plant Engineer, Ditching Machine with dual attachment, Tractor Mounted Loaders, Hydro Crane, Standard or Dinkey Locomotives, Scoopmobiles, Euclid Loader, Soil Cement Machine, Back Filler, Elevating Machine, Power Blade, Drilling Machine, including Well Testing, Caissons, Shaft or any similar type drilling machines, Motor Driven Paint Machine, Pipe Cleaning Machine, Pipe Wrapping Machine, Pipe Bending Machine, Apsco Paver, Boring Machine, (Head Equipment Greaser), Barber-Greene Loaders, Formless Paver, (Well Point System), Concrete Spreader, Hydra Ax, Span Saw, Marine Scoops, Brush Mulcher, Brush Burner, Mesh Placer, Tree Mover, Helicopter Crew (3), Piledriver-Skid or Crawler, Stump Remover, Root Rake, Tug Boat Operator, Refrigerating Machine, Freezing Operator, Chair Cart- Self-Propelled, Hydra Seeder, Straw Blower, Power Sub Grader, Bull Float, Finishing Machine, Self-Propelled Pavement Breaker, Lull (or similar type Machine), Two Air Compressors, Compressors hooked in Manifold, Chip Spreader, Mud Cat, Sull-Air, Fork Lifts (except when used for landscaping work), Soil Stabilizer (Seaman Tiller, Bo Mag, Rago Gator, and similar
Class 2. Concrete Mixers without Skips, Rock Crusher, Ditching Machine under 6’, Curbing Machine, One Drum Machines without Tower or Boom, Air Tugger, Self-Propelled Concrete Saw, Machine Mounted Post Hole Digger, two to four Generators, Water Pumps or Welding Machines, within 400 feet, Air Compressor 600 cu. ft. and under, Rollers on Aggregate and Seal Coat Surfaces, Fork Lift (when used for landscaping work), Concrete and Blacktop Curb Machine, One Water Pump, Oilers, Air Valves or Steam Valves, One Welding Machine, Truck Jack, Mud Jack, Gunnite Machine, House Elevators when used for hoisting material, Engine Tenders, Fireman, Wagon Drill, Flex Plane, Conveyor, Siphons and Pulsometer, Switchman, Fireman on Paint Pots, Fireman on Asphalt Plants, Distributor Operator on Trucks, Tamper, Self-Propelled Power Broom, Striping Machine (motor driven), Form Tamper, Bulk Cement Plant, Equipment Greaser, Deck Hands, Truck Crane Oiler-Driver, Cement Blimps, Form Grader, Temporary Heat, Throttle Valve, Super Sucker (and similar type of equipment).

Class 3. Power Cranes, Truck or Crawler Crane, Rough Terrain Crane (Cherry Picker), Tower Crane, Overhead Crane.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.
To: Prospective Bidders
Re: ADDENDUM NUMBER 1 TO THE BIDDING DOCUMENTS FOR:

University of Illinois – Urbana Champaign
Ice Arena – Portable Ice Refrigeration System
UIUC Project Number: U15086
Architect’s Project Number: 215067.00

This addendum forms a part of the bidding and contract documents and modifies the original bidding documents dated November 17, 2015. Acknowledge receipt of this addendum in the space provided on Bid Form. FAILURE TO DO SO MAY SUBJECT BIDDER TO DISQUALIFICATION.

PART 1 ADDENDA TO THE PROJECT MANUAL
A. Document: Table of Contents.
   1. Page 1, Bidding Requirements
      a. ADD the following: “00 90 01 Addendum Number 1……………………………….1 page.”

B. Document 00 10 00 Notice to Bidders
   2. Page 6, Article 2.5 Prebid Conference: REVISE “Mandatory” to READ “Non-Mandatory”.
   3. Page 6, Article 2.9, Paragraph 2.9A, Division of Work. DELETE “02 Plumbing Work”.

C. Document 00 20 00 – General Instructions to Bidders

D. Document 00 40 00 – Bid
   1. Page 22, Page 24, Page 27. DELETE “Division 02 - Plumbing Work”.
   2. Page 28, Article 8.0 Assignment of Contracts, Paragraphs 8.1 and 8.2: DELETE “Division 02 Plumbing Work”.

PART 2 ADDENDA TO THE DRAWINGS - NONE

PART 3 CLARIFICATIONS
A. Delete all Reference to Division 2 in the Front End Documents. There is no Division 2 work as part of this contract.

END OF SECTION
This addendum consists of 1 page.
This addendum has 0 attached pages identified below:
PART 1 GENERAL

1.01 PROJECT
A. Project Name: Ice Arena - Portable Ice Refrigeration System.
B. Owner's Name: University of Illinois at Urbana - Champaign.
C. The project consists of the replacement of the existing ice refrigeration system with a new portable system. Work shall include; demolition of the existing dasher boards and glass, cutting and removal of the existing ice slab to accommodate the new headers and piping required for the portable ice system; installation of a new reduced size rink (+/-192' x 100') including new dasher boards, glass and related components; installation of a rooftop chiller, pumps and modification of the structure above room 130 for support of the new system; replacement/ modification of the flooring and platforms around the rink as required for accessibility and to infill the platform area related to relocation of the west dasher boards; and evacuation/ remediation of the existing calcium chloride and asbestos pipe wrap in the tunnels at locations of piping modification and additional abatement/ lead paint remediation as indicated on the drawings.

1.02 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 00 - Agreement Form.

1.03 DESCRIPTION OF ALTERATIONS WORK
A. Asbestos/ Lead/: The project includes removal of ACM Pipe Wrap in the basement level tunnel and vapor barrier at concrete slab areas as indicated, and removal/ modification of steel handrails as required for containment areas as containing lead in accordance with EPA/HUD standards and shall be repaired as indicated. Contractor shall comply with OSHA regulations when disturbing these materials
B. Refrigerant and Calcium Chloride Abatement: The project includes removal/ recapture of the existing ice system refrigerant and removal of the Calcium Chloride. Contractor shall comply with OSHA regulations when disturbing these materials. R22 Refrigerant will be reclaimed by the owner.
C. Demolition: Scope of demolition and removal work is shown on drawings and specified in Section 02 41 00.
D. Alterations: Scope of alterations work is shown on drawings.
E. Heating, Piping and Temperature Controls – Installation of new Ice Refrigeration System and related chiller and piping.
F. Electrical – Modify circuits as required to support the new Ice Refrigeration system as indicated in the drawings and specifications.

1.04 WORK BY OWNER
A. The R22 Refrigerant will be reclaimed by the owner.

1.05 OWNER OCCUPANCY
A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
B. Owner intends to occupy the Project upon Substantial Completion.
C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
D. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Contractor to coordinate occupancy of the premises with the owner and document the workers that will be on site prior to contractor access. This document will be maintained at the Main Office.
B. Arrange use of site and premises to allow:
   1. Owner occupancy.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open
during construction period; provide temporary exit signs if exit routes are temporarily
   altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

1.07 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS
   A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts.
      Specific items of work listed under individual contract descriptions constitute exceptions.
   B. Section 01 23 00 - Alternates.
   C. Section 01 31 00 - Project Management and Coordination.
   D. Section 01 33 23 - Shop Drawings, Product Data, and Samples.
   E. Section 01 35 00 - Special Procedures.
   F. Section 01 35 43 - Environmental Requirements Site Enforcement.
   G. Section 01 35 46 - Indoor Air Quality Procedures.
   H. Section 01 41 00 - Regulatory Requirements - Abatement
   I. Section 01 42 00 - Definitions - Abatement
   J. Section 01 51 00 - Temporary Utilities.
   K. Section 01 55 00 - Vehicular Access and Parking.
   L. Section 01 56 00 - Temporary Barriers and Enclosures.
   M. Section 01 61 00 - Product Requirements.
   N. Section 01 61 16 - Volatile Organic Compound (VOC) Content Requirements.
   O. Section 01 70 00 - Execution and Closeout Requirements.
   P. Section 01 74 23 - Final Cleaning.
   Q. Section 01 76 00 - Protecting Installed Construction.
   R. Section 01 77 00 - Closeout Procedures and Requirements: Including all Exhibits
   S. Section 01 77 40 - Work Area Clearance
   T. Section 01 78 23 - Operations and Maintenance Data.
   U. Section 01 78 39 - Project Record Documents.
   V. Section 01 79 00 - Demonstration and Training.

1.08 DIVISION NO. 01 - GENERAL CONSTRUCTION
   A. Division 01 - General Requirements:
      1. Specification sections listed above.
      2. Section 01 74 23 - Final Cleaning
   B. Division 2 - Existing Conditions including all required Abatement, Lead Removal and
      Hazardous Material Remediation.
   C. Division 3 - Concrete
   D. Division 5 - Metals
   E. Division 6 - Woods and Plastics
   F. Division 7 - Thermal and Moisture Protection
   G. Division 8 - Doors and Windows - Not Used
   H. Division 9 - Finishes
   I. Division 10 - Specialties - Not Used
J. Division 11 - Equipment - Not Used
K. Division 12 - Furnishings - Not Used
L. Division 13 - Special Construction
M. Division 31 - Earthwork
N. Provide all Work except Work specifically assigned to other contractors in this Section.

1.09 CONTRACT NO. 3 - HEATING, PIPING, A/C AND CONTROLS WORK
A. Specification sections listed above as applicable to all contracts.
B. Division 13 - Special Construction
C. Division 23 - Heating, Ventilating, and Air Conditioning:
   1. Section 23 05 00 - Basic HVAC Requirements.
   2. Section 23 05 03 - HVAC Through-Penetration Firestopping.
   3. Section 23 05 05 - HVAC Demolition for Remodeling.
   4. Section 23 05 29 - HVAC Supports and Anchors.
   5. Section 23 05 53 - HVAC Identification.
   6. Section 23 05 93 - Testing, Adjusting and Balancing.
   7. Section 23 07 19 - HVAC Piping Insulation.
   8. Section 23 09 00 - Controls.
   9. Section 23 09 13 - Instrumentation.
  10. Section 23 21 00 - Hydronic Piping.

1.10 DIVISION NO. 05 - ELECTRICAL AND FIRE ALARM WORK
A. Specification sections listed above as applicable to all contracts.
B. Division 26 - Electrical:
   1. Section 26 05 00 - Basic Electrical Requirements.
   2. Section 26 05 03 - Through Penetration Fireproofing.
   3. Section 26 05 05 - Electrical Demolition for Remodeling.
   4. Section 26 05 13 - Wire and Cable.
   5. Section 26 05 26 - Grounding and Bonding.
   6. Section 26 05 33 - Conduit and Boxes.
   7. Section 26 05 53 - Electrical Identification.
   8. Section 26 24 19 - Motor Control.
   9. Section 26 28 13 - Fuses.
  10. Section 26 28 16 - Disconnect Switches.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
PART I - GENERAL

1.01 SUMMARY
   A. This Section includes administrative provisions for coordinating construction operations on the Project related to the following:
      1. Coordination Drawings.

1.02 COORDINATION DRAWINGS
   A. Prepare Coordination Drawings if limited space is available, and maximum utilization of space is required for efficient installation of different components or if coordination is required for installation of products and materials fabricated by different Contractors.
   
   B. Content: Provide project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents. Include the following information, if applicable:
      1. Indicate functional and spatial relationships of architectural, existing structural elements, civil, mechanical, and electrical system components.
      2. Indicate required installation sequences.
      3. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to AE for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
   
   C. Responsibility: Each Contractor has the responsibility to submit Coordination Drawings when required per this Section. Each Contractor who has Assigned Subcontractors shall have overall responsibility for the Coordination Drawings of their Assigned Subcontractors.
   
   D. Number of Copies: Submit (3) copies of each Coordination Drawing submittal to the AE.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Products include, but are not limited to, the following:
   1. Shop Drawings.
   2. Product Data.
   3. Samples.
   5. Informational Submittals.
   6. Other Submittals.

B. Execution:
   1. Coordinating Submission Scheduling: Submit Submittals with sufficient time for review, including of resubmittals, submittals for activities that require sequential steps, and simultaneous review for activities that are part of the same element of work. No extensions given for deadlines due to lack of sufficient time allowed by Contractor for review.
   2. Submission and Distribution: Label submittals with information outlined, allow sufficient space for AE’s stamp, and submit using a Transmittal form.
   3. AE’s Actions: AE will review, mark with an Action Stamp and indicate action taken, and return submittal. Work may not proceed until submittal is approved.

1.02 RELATED SECTIONS

A. Section 01 78 23 – Operation and Maintenance Data
B. Section 01 78 39 – Project Record Documents

PART 2 PRODUCTS

2.01 SHOP DRAWINGS

A. Shop Drawings are documents prepared by contractors, manufacturers, suppliers, or subcontractors or to illustrate details and techniques for a portion of the work, usually to show compliance with the Contract Documents or to show how specialized work will be incorporated into the project. They are not Contract Documents, or standard documentation from the manufacturer.

B. Shop Drawings include, but are not limited to:
   1. Fabrication drawings.
   2. Installation drawings.
   5. Templates and patterns.

C. Include the following information on Shop Drawings:
   1. Equipment tags.
   2. Dimensions, including dimensions established by field measurement.
   3. Scale.
   4. Identification of products and materials included.
   5. Compliance with specified standards.
   6. Notation of coordination requirements.
   7. Construction sequences and relationships of separate components where necessary to avoid conflicts in utilization of the space available.
   8. Indication of deviation from Contract Documents, reproducible in black and white.
   9. Space for Contractor’s review and action taken by AE. See Part 3 “Execution.”

D. Shop Drawings Submittal Instructions:
   1. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
2. Submit One Set of PDF files as electronic copies via web-based project management software or by a shared “dropbox” method. One method of delivery must be selected and be kept consistent throughout the course of the project.

2.02 PRODUCT DATA

A. Product Data are documents that illustrate physical appearance, size, performance capabilities and limitations, and other characteristics of materials and equipment for some portion of the work.

B. Product Data include, but are not limited to:
   1. Manufacturer’s product specifications.
   2. Manufacturer’s installation instructions.
   4. Catalog cuts.
   5. Roughing-in diagrams and templates.
   7. Manufacturer’s performance curves.
   8. Operational range diagrams.
   10. Standard product operating and maintenance manuals.

C. Include the following information when preparing Product Data:
   1. Equipment tags.
   2. When Product Data includes information on several similar products, some of which are not required for use on the Project, mark copies clearly to enable black and white copying to indicate which products are applicable.
   3. When Product Data must be specially prepared for required products, materials, or systems because standard printed data are not suitable for use, submit as Shop Drawings not Product Data.
   4. Manufacturer’s printed recommendations.
   5. Compliance with recognized trade association standards.
   6. Compliance with recognized testing agency standards.
   7. Application of testing agency labels and seals.
   8. Notation of dimensions verified by field measurement.
   9. Notation of coordination requirements.

D. Product Data Submittal Instructions:
   1. Submit One Set of PDF files as electronic copies via web-based project management software or by a shared “dropbox” method. One method of delivery must be selected and be kept consistent throughout the course of the project.

2.03 SAMPLES

A. Samples are physical examples of materials, finishes, equipment, or workmanship that illustrate aesthetic and functional characteristics of a material or product and establish standards for Work to be done. Samples shall be retained as part of the project record documents.

B. Samples include, but are not limited to:
   1. Interior Finishes:
      a. Paint chips
      b. Exposed HVAC elements with custom color finishes
      c. Exposed lighting elements with custom color finishes
   2. Exterior Finishes:
      a. Mortar
      b. Sealant

C. Include the following when preparing Samples:
   1. Submit full-size, fully fabricated Samples, cured and finished in the manner specified.
2. Mount, display, or package Samples in the manner specified to facilitate review of
qualities indicated. Prepare Samples to match the AE’s sample where so indicated.
Include the following information:
   a. Material or product proposed for use.
   b. Generic description of the Sample.
   c. Size limitations.
   d. Sample source.
   e. Product name or name of manufacturer.
   f. Compliance with recognized standards.
   g. Compliance with governing regulations.
   h. Availability.
   i. Delivery time.

D. Samples Submittal Instructions:
   1. Submit Four (4) Sample(s) (minimum one for owner), except as noted:
      a. When variation in color, pattern, texture, or other characteristic is inherent in the
         material or product represented, submit a Sample size large enough, or submit
         multiple Samples necessary, to show approximate limits of the variations.
      b. Refer to other Specification Sections for requirements for Samples that illustrate
         workmanship, fabrication techniques, assembly details, connections, operation, and
         similar construction characteristics.
   2. Maintain Samples, as returned by the AE, at the Project Site, available for quality-control
      comparisons throughout the course of construction activity, except as noted:
      a. Refer to other Specification Sections for Samples to be returned to the Contractor for
         incorporation in the Work. Such Samples must be in an undamaged condition at time
         of use. On the transmittal form, indicate such special requests about disposition of
         Sample submittals.
      b. Samples not incorporated into the Work or otherwise designated as the Owner’s
         property, are the property of the Contractor and shall be removed from the site prior
         to Substantial Completion.
   3. Unless the AE observes noncompliance with provisions of the Contract Documents, the
      submittal may be used to obtain final acceptance and serve as the final submittal.

2.04 QUALITY ASSURANCE SUBMITTALS

A. Quality Assurance Submittals are records that document that a facility, system or assembly
meets defined objectives and criteria.

B. Quality Assurance Submittals include, but are not limited to:
   1. Design data.
   2. Certifications. Where other Sections of the Specifications require certification that a
      product, material, or installation complies with specified requirements, submit a notarized
      certification from the manufacturer certifying compliance with specified requirements.
      a. Signature: Certification shall be signed by an officer of the manufacturer or other
         individual authorized to sign documents on behalf of the company.
   3. Manufacturer’s instructions.
   4. Manufacturer’s Field Reports.
   5. Inspections and Test Reports.
   6. Original Field Checklists. Original checklists or forms used by the factory or field
      technician are required.
   7. Test Reports.

C. Include the following when preparing Quality Assurance Submittals:
   1. U of I Project Number and Name.
   2. Specification Section Number and Name.
   3. Equipment tags.

D. Quality Assurance Submittals Submittal Instructions (use in conjunction with Part 3
   “Execution”):
1. Submit One Set of PDF files as electronic copies via web-based project management software or by a shared “dropbox” method. One method of delivery must be selected and be kept consistent throughout the course of the project.

2.05 INFORMATIONAL SUBMITTALS

A. Informational Submittals are records that document the information the AE requires to verify performance and quality control of project requirements, but do not require approval. They are also used as verification and certification that the installed work or portion of the work meets the specified requirements.

B. Informational Submittals include (but are not limited to):
   1. Meeting Minutes.
   2. Construction Photographs.

C. Include the following when preparing Informational Submittals:
   1. U of I Project Number and Name.
   2. Specification Section Number and Name.
   3. Equipment tags.

D. Informational Submittals Submittal Instructions:
   1. Submit One Set of PDF files as electronic copies via web-based project management software or by a shared “dropbox” method. One method of delivery must be selected and be kept consistent throughout the course of the project.

2.06 OTHER SUBMITTALS

A. Other Submittals are records that document some part or associated part of the construction Work not previously covered.

B. Other Submittals may include (but are not limited to):
   1. Warranties.

C. Include the following when preparing Other Submittals:
   1. U of I Project Number and Name.
   2. Specification Section Number and Name.
   3. Equipment tags.

D. Other Submittals Submittal Instructions:
   1. Submit One Set of PDF files as electronic copies via web-based project management software or by a shared “dropbox” method. One method of delivery must be selected and be kept consistent throughout the course of the project.

PART 3 EXECUTION

3.01 COORDINATING SUBMISSION SCHEDULING:

A. To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
   1. Allow 3 weeks for the Coordinating Contractor’s and AE’s review of each submittal.
   2. Allow additional time if the Coordinating Contractor and AE must delay processing to permit coordination with other submittals, due to:
      a. Activities that require sequential steps.
      b. Activities that are part of the same element of work.
   3. When necessary to provide an intermediate submittal, process the intermediate submittal in the same manner as the initial submittal.
   4. The Owner will not authorize an extension of time because of the Contractor’s failure to transmit submittals to the Coordinating Contractor and AE sufficiently in advance of the Work to permit processing.

3.02 SUBMISSION AND DISTRIBUTION:

A. Prepare Submittals as follows:
   1. Place a permanent label or title block on each submittal for identification.
   2. Indicate name of the firm or entity that prepared each submittal on the label or title block.
3. Provide a space approximately 4 by 5 inches on the label or beside the title block to record the Contractor's review and approval markings and the action taken by the AE.

4. Include the following information on the label for processing and recording action taken.
   a. U of I Project Number and Name.
   b. Date.
   c. Name and address of the AE.
   d. Name and address of the Contractor.
   e. Name and address of the subcontractor.
   f. Name and address of the supplier.
   g. Name of the manufacturer.
   h. Number and title of appropriate Specification Section.
   i. Drawing number and detail references, as appropriate.

5. Give a unique number to the submittal as follows:
   a. sssssssss-nn-rr
   b. s = specification number
   c. n = next sequential number
   d. r = revision number
   e. Indicate unique number on both submittal and transmittal form.

B. Transmit each submittal by use of a transmittal form.

C. Resubmittals: Each resubmittal should indicate whether it fully replaces the previous submittal, replaces a portion of a previous submittal, or is in addition to a previous submittal.

1. If a resubmittal replaces a portion of a previous submittal, indicate previous unique submittal number, and indicate clearly by page numbers, section numbers, or section title the portion of the previous submittal replaced.

2. If a resubmittal is in addition to a previous submittal, indicate previous submittal by unique submittal number.

D. Submit number of copies as indicated in each section of Part 2.

3.03 AE’S ACTIONS

A. Except for Informational Submittals where no action and return of submittals is required, the AE will review each submittal, mark to indicate the action taken, and return.

B. Action Stamp: The AE will stamp each submittal with a uniform action stamp. The AE will mark the stamp appropriately to indicate the action taken, as follows:

1. Approved: Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final acceptance will depend on that compliance.

2. Approved as Noted: Work covered by the submittal may proceed provided it complies with both the AE's notations or corrections on the submittal and requirements of the Contract Documents. Final acceptance will depend on that compliance.

3. Revise/Resubmit or Rejected/Resubmit: Do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the AE's notations. Resubmit without delay. Repeat if necessary to obtain an "Approved" or "Approved as Noted" action mark.

4. No Action Required: When a submittal is primarily for information or record purposes or for special processing or other contractor activity, the submittal will be marked "No Action Required" and returned without review.

END OF SECTION
PART I - GENERAL

1.01 FIRE PROTECTION
   A. Regulations: The Contractor shall comply with the University of Illinois Regulations entitled Fire Safety in Welding and Cutting Operations and Fire Prevention During Building Construction Operations. Copies of these regulations can be obtained from the Owner and shall be posted by the Contractor at the site of work.
   B. Fires: The Contractor shall prohibit the lighting of fires about the premises and use due diligence to see that such prohibition is enforced. Debris and waste materials shall not be burned at the construction site but shall be promptly removed to prevent the accumulation of combustibles on the site or within the building.
   C. Smoking: Smoking is prohibited in all U of I facilities. The Contractor shall furnish and post "NO SMOKING" signs at appropriate locations throughout the building areas and other enclosed spaces on the site where his operations are conducted.
   D. Welding and Cutting: It shall be the responsibility of the Contractor to notify the Owner's Service Department at the Facilities and Services Division (217-333-0340) at least 4 hours in advance of the work when welding or other fire hazardous work is to be performed and to take precautionary measures to prevent fire.
   E. Heater: The heaters on site shall be properly installed to protect combustible walls, floor and roof. Salamander heaters or other types of open flame heaters shall not be used except with the special permission of the AE and then only when such salamanders or open flame heaters are maintained under constant supervision.
   F. Flammables: Gasoline and other fuels shall be kept and handled from National Board of Fire underwriter's approved safety cans and shall be stored away from hazardous work areas.

1.02 ASBESTOS REMOVAL
   A. Remove Prior to Construction: The U of I has an Asbestos Abatement Program. This program requires that any area within a U of I facility that is to be remodeled must be inspected for the presence of asbestos containing building materials (ACBMs) prior to commencement of work activities. All readily accessible asbestos should be removed before construction work proceeds. No workers or other activity should be allowed in the area containing suspected material until it has been removed or certified as not having friable asbestos.
   B. Discovery During Construction: When discovering asbestos material during construction, notify the Owner so appropriate action may be taken.

1.03 HOISTS, SCAFFOLDS AND LADDERS
   A. Scaffolds and Ladders: The Contractor shall furnish, erect, maintain and move all scaffold and ladders required for his Work. Scaffolds shall be constructed and maintained in accordance with all applicable state and federal laws and local ordinances. Scaffolds and ladders shall be promptly removed after their purpose has been served.

1.04 SITE SECURITY
   A. Daily Inspection: Full-time watchmen will not be specifically required, but the Contractor shall provide inspection of the building and site daily while the work is in progress and shall take whatever measures are necessary to secure the building from theft, vandalism and unauthorized entry.

1.05 UTILITY LOCATE PROCEDURE
   A. Call Before You Dig: Before performing any excavation on the University of Illinois at Urbana-Champaign campus, Willard Airport, Allerton Park, 4 H Camp, and/or The Construction Engineering Research Laboratory (CERL), call JULIE at 800-892-0123, or simply dial 811.
   B. Excavation: Excavation means any operation in which earth, rock, or other material in or on the ground is moved, removed, or otherwise displaced by means of any tools, power equipment or explosives, and includes, without limitation, grading, trenching, digging, ditching, drilling, augering, boring, tunneling, scraping, cable or pipe plowing, and driving.
C. Required by Law: Calling for a utility locate is required by the Illinois Underground Utility Facilities Damage Prevention Act, and is applicable everywhere in the State of Illinois.

D. JULIE Membership: The University of Illinois at Urbana-Champaign is a member of JULIE and operates in accordance with all applicable methods, policies and procedures of JULIE.

E. White Lining of Proposed Excavation: The Illinois Underground Utilities Facilities Damage Prevention Act requires all excavators to white-line the dig site when practical. JULIE and its member companies strongly urge white-lining prior to processing their locate request. In winter months when snow is present, the use of black paint or flags is encouraged. White-lining is the process of going to the proposed excavation site and outlining or marking the area where proposed excavation digging will occur with white paint and/or white flags prior to contacting JULIE.

F. Utilities on the Campus: The underground infrastructure of many different utility companies is present under the campus. A partial list of companies includes: AmerenIP, AmerenCIPS, Illinois American Water, Comcast, ATT Telecommunications, Sprint Telecommunications, Lightcor Communications, City of Urbana, City of Champaign, City of Savoy, Kentucky Data Link, and several others.

G. Additional Information: Additional information may be located at the following locations: <http://www.illinois1call.com/index.htm> and <http://www.fs.uiuc.edu/departmentwide/utilities/utilitylocating.cfm>.

1.06 CAMPUS UTILITY AND BUILDING SYSTEM OUTAGE PROCEDURE

A. General:
   1. 5 Days Notice: Outages for building systems and campus utilities shall be scheduled at least 5 working days in advance, at the convenience of the continuing operations of the Urbana campus. Please note that outages are scheduled at the convenience of the continuing operations of the Urbana campus. Research and Housing Operations may allow outages only when they are closed or during times when classes are not in session. Significant advanced planning is necessary when an outage is required.
   2. Costs Incurred: New construction and remodeling projects shall fund all costs incurred in operating systems to accommodate any scheduled or unscheduled outages. Small project remodeling shall have costs and funding approved by campus representatives.

B. Planning:
   1. Contact Project Manager: The Contractor shall advise the U of I Project Manager of the need for an outage. It shall be the responsibility of the U of I Project Manager to contact the person within the Facilities and Services (F&S) Division that has the operating responsibility for the subject system.
   2. Contact Service Office: In the event that a Project does not have an assigned F&S liaison person, project personnel shall call the F&S Service Office at (217) 333-0340. F&S Service Office Personnel will direct the caller to the person within F&S that has the responsibility for the subject system.
   3. Provide Necessary Information: When requesting the outage, the Contractor shall include, as a minimum, the following:
      a. Project contact person, including telephone
      b. Type of outage and specific systems affected
      c. Building or specific areas within buildings affected
      d. Date and time of outage
      e. Length of outage
      f. Specific reason for outage
   4. F&S Will Evaluate Request: F&S personnel will evaluate the request and determine the magnitude of the shutdown required and its impact on the continuing operations of campus departments. The Contractor will then be advised of the schedule for the requested outage. It should be noted that many outages are required to be conducted during evening, weekends, and campus holiday periods.

C. Scheduling:
1. F&S Service Office Will Schedule: When an available date and time are acceptable to the Project, the outage will be formally scheduled by the F&S Service Office.

2. Contacting Campus Community: The F&S Service Office is responsible for contacting numerous members of the campus community when scheduling outages. Therefore, once an outage is scheduled, meeting the established schedule is of critical importance.

D. Execution:
   1. Begin Work Promptly: The Contractor shall agree to start work promptly as scheduled.
   2. Cancellation of Outage: In the event that the Contractor’s required material or labor is not available, or other significant problems arise at the scheduled starting time, F&S reserves the right to cancel the outage.

PART 2 - PRODUCTS
2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION
3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
PART 1 - GENERAL

1.1 GENERAL
A. The ice systems contractor shall provide labor and materials for a fully operating complete ice rink and system including, but not limited to, the ice refrigeration package, the roll out rink floor matting system, the dasherboards and all electrical power and controls.

1.2 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. All ice system Division 13 sections, and related are to be grouped.

1.3 QUALIFICATIONS
A. Refrigeration installer shall be pre-approved and have installed a minimum of six (6) artificial ice rinks to be eligible to submit a bid on this work.
B. The refrigeration installer shall have sufficient qualified personnel available at time of installation and applicable and sufficient equipment to perform the installation work.
C. The refrigeration installer shall provide service for the equipment after installation.
D. The refrigeration installer shall be subject to the Prevailing Wage laws of the State of Illinois.
E. The refrigeration installer must be experienced in the assembly of ice plants from component parts as shown on the plans. Refrigeration installer shall submit the names and contact information for at least six (6) rinks where they have assembled successful ice systems in the last five (5) years.

1.4 REFERENCES
A. ACI: American Concrete Institute
B. AGA: American Gas Association
C. ANSI: American National Standards Institute
D. ARI: American Refrigeration Institute
E. ASHRAE: American Society of Heating Refrigeration and Air Conditioning Engineers.
F. ASME: American Society for Mechanical Engineers
G. ASTM: American Society for Testing and Materials
I. IIAR: International Institute of Ammonia Refrigeration
J. MSS: Manufacturer's Standardization Society of the Valve and Fitting Industry
K. NEMA: National Electrical Manufacturers Association

1. NFPA: National Fire Protection Association
2. UL: Underwriters Laboratories, Inc.

1.5 RELATED WORK
A. Division 01: Shop Drawings, Product Data, and Samples
B. Division 01: Storage and Protection
C. Division 01: Product Options and Substitutions
D. Division 01: Project Record Documents
E. Division 03: Concrete
F. Division 06: Rough Carpentry (Wood blocking in walls required for attaching mechanical items.)
G. Division 07: Flashing and Sheet Metal (Flashing for mechanical items penetrating walls and roof.)
H. Division 09: Painting (Painting of pipe).
I. Division 23: HVAC
J. Division 26: Electrical.
K. Division 33: Utilities Excavating and Backfilling.

1.6 SUBMITTALS

A. Submit under provisions of Division 01.

B. Include Products as specified in the individual sections of Division 13.

C. Submit shop drawing and product data, eight (8) hard copies and one (1) electronic copy, grouped to include complete submittals of related systems, products, and accessories in a single submittal.

D. Submit eight (8) hard copies of parts, operations, and maintenance manuals on major pieces of equipment.

E. Submit copies of shop drawings as per Division 01, including:

1. Concrete pads and foundations including anchor bolt and sleeve locations.
2. Layouts for ice system equipment rooms, including:
   a. Room dimensions
   b. Support column locations
   c. Locations and dimensions of equipment foundations and pads required
   d. Locations and dimension of equipment and apparatus, including electrical control panels and starters, and service and coil pull areas.
   e. Locations of wall mounted equipment
   f. Trench locations and sizes
   g. Sleeve locations in equipment rooms

F. Brochures: Submit manufacturer's product data and brochures including:

1. Complete descriptions
2. Illustrations
3. Rating data, accessories, dimensional data, and features as scheduled on drawings and specified herein.
4. Capacities stated in the terms specified
5. Performance curves for all pumps

1.7 REGULATORY REQUIREMENTS

C. ANSI Handicapped Code-A117.1
D. 2009 Pennsylvania State Building Code
E. 2009 International Building Codes
1.8 PROJECT/SITE CONDITIONS

A. Ice rink system layout indicated on drawings is specific and shall be adhered to as drawn. Coordinate ice system work with other trades prior to installation. Install work in locations shown on drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other sections, if jobsite conditions prevent installation as shown. Obtain permission of Engineer before proceeding.

C. Place anchors, sleeves, and supports prior to pouring concrete or installation of masonry work.

D. Cause as little interference or interruption of existing utilities and services as possible. Schedule work that will cause interference or interruption in advance with Owner, authorities having jurisdiction, and all affected trades.

E. Determine sizes and verify locations of existing utilities on or near site.

F. Keep roads and mechanical spaces clear of materials and debris.

G. Visit site and be informed of conditions under which Work must be performed.

1.9 COORDINATION DRAWINGS

A. Prepare and submit coordination drawings for work under this Division, as specified in Division 01, in full cooperation with persons performing work under other Divisions.

B. Coordination Drawings shall be prepared to include the following:

1. Drawn to a scale of 1/4" = 1'-0"
2. Room dimensions
3. Sheet size matching contract documents
4. Pipe sizes with bottom elevation from finished floor
5. Show lighting, equipment, piping, columns, and beams with mounting heights
6. Concrete pad and foundation layouts including anchor bolt and sleeve locations
7. Dimensioned floor drain locations
8. Wall mounted equipment.

1.10 REFERENCE STANDARDS AND DEFINITIONS

A. Comply with provisions of Division 01.

1.11 PRODUCT SUBSTITUTIONS

A. Comply with provisions of Division 01.

1.12 RECORD DRAWINGS

A. Provide record drawings that illustrate the work of Division 13 sections as finally constructed. Deliver record drawings to the Engineer in a form suitable for reproduction.

B. Record drawings shall reflect all changes made to the Contract Documents, whether generated by addenda, change orders, or field conditions. Maintain a daily record of these changes and keep current set of drawings showing these changes.
C. Deliver record drawings to Engineer within 30 days of Substantial Completion.

1.13 **OWNING AND OPERATING MANUALS**

A. Comply with the requirements of Division 01.

B. Manuals shall include clear and comprehensive instructions with appropriate graphics to enable owner to operate and maintain all systems specified herein.

**PART 2 - PRODUCTS**

2.1 **EQUIPMENT SUPPORTS**

A. Structural steel for supports: ASTM A36

1. Use galvanized members installed in areas of high humidity or condensation, and outside.
   a. Furnish other members with shop coat of red lead primer.

2. Retouch primer after field welding.

2.2 **FLASHINGS AND COUNTERFLASHINGS**

A. Furnish materials and coordinate installation for flashing and counterflashing roof and wall penetrations for vents, pipe, drains, and ducts.

B. Materials:

   1. Sheetmetal: 24 gauge minimum ASTM A525, Class G90
   2. Sheet lead: 6 pounds per square foot
   3. Stainless steel: Minimum 20 gauge
   4. Sheet copper: 24 OZ/SF
   5. Vent Stack Fitting: Josam 1830 or Jay R. Smith 1750

2.3 **NAMEPLATES AND TAGS**

A. Acceptable manufacturers: Seton Nameplate Corporation

B. Rigid plastic, "Setonite" or bakelite with engraved lettering, minimum 1/2" high

C. Provide brass valve tags, at least 1-1/2 inch in diameter, with alpha numeric ID. Tag shall have permanently stamped black filled letters showing service and black filled number showing valve or equipment number. At substantial completion, a schedule of all valves shall be submitted to the Architect and owner.

2.4 **SLEEVES**

A. Provide sleeves for all piping installed under this Division as specified.

2.5 **ELECTRIC MOTORS**

A. Submit all motor information with submittals and shop drawings for ice system equipment.
2.6 **ICE SYSTEM INSULATION**

A. Provide insulation for ice systems piping as specified per Section 13 18 13.

B. Ice rink refrigeration package to be insulated from manufacturer. Insulation to include all piping, pumps, chillers, compressors, and heat exchangers.

**PART 3 - EXECUTION**

3.1 **EXCAVATING AND BACKFILLING**

A. Provide trenching, excavating, and backfilling necessary for performance of work indicated in Contract Documents. Coordinate requirements with provisions of Division 02.

3.2 **CUTTING AND PATCHING**

A. Repair or replace damage caused by cutting or installation of work specified in Division 13 sections.

B. Perform repairs with materials, which match existing and install in accordance with the appropriate section of these specifications.

3.3 **FLASHING AND COUNTERFLASHING**

A. Counterflash ducts and pipes where penetration of roofs and outside walls occurs.

3.4 **DELIVERY, STORAGE, AND PROTECTION**

A. Insofar as possible, deliver items in manufacturer's original unopened packaging. Where delivery in original packaging is not practical, provide cover and shielding for all items with protective materials to keep them from being damaged. Use care in loading, transporting, unloading, and storing to keep items from being damaged.

B. Store items in a clean, dry place, and protect from damage.

C. Protect nameplates on motors, pumps, and similar equipment. Do not paint or insulate over nameplate data.

D. Keep dirt and debris out of pipes.

E. Repair, restore, and replace damaged items.

F. Cover factory finished equipment during work of finished trades, such as pumps.

3.5 **PIPE IDENTIFICATION**

A. Pipe Identification:

1. Identify piping by tagging (to denote contents and direction of flow) piping at no more than 25 foot intervals at valves, and at least once in each separate space through which the pipe passes.

2. Tagging script shall be a minimum of 2" high letters.
3.6 PIPE, EQUIPMENT, ROOM AND APPARATUS IDENTIFICATION

A. Acceptable Manufacturers: Seton Name Plate Corporation or equal

B. Nameplates: Rigid plastic, "Setonite" or bakelite, with engraved lettering (indicating names and numbers of mechanical apparatus), a minimum of 1/2" high. Fill engraved lettering with a permanent coloring material, which contrasts with color of tag material to allow for easy reading.

C. Pipe Labels: Seton "Setmark" type snap-on full encirclement type markers for fluids, with "Opti-Code" ammonia pipe markers on ammonia piping, in "Setmark" system.

D. Use names, numbers, and abbreviations appearing in schedules on Contract Drawings.

E. Provide nameplates, located in a conspicuous location directly on the equipment or apparatus, for ice system equipment including, but not limited to:
   1. Starters
   2. Ice Chiller Plate and Frame Exchangers
   3. Pumps
   4. Compressors
   5. Liquid Receiver

F. Nametag Fasteners: Commercial quality, rust resisting nuts and bolts with backwashers, self tapping screws, or rivets. If equipment surface does not allow for direct attachment, use copper or brass rings to attach tags.

G. VALVE TAGS
   1. Each manual and automatic control valve shall be identified with a brass tag. The tag shall contain an alphanumeric I.D. which shall be unique and separate/different from the house HVAC and plumbing systems.
   2. A valve schedule shall be provided to Engineer and Owner. Mount valve schedule under glass and mount as directed by Owner.
   3. Securely fasten tags to valves with a brass "S" hook or chain.

3.7 CLEANING MECHANICAL SYSTEMS

A. General Cleanup:
   1. Upon completion of contract and progressively as work proceeds, clean up dirt, debris, oil materials, etc., and remove from site, keeping premises in neat and clean condition to satisfaction of the Architect.
   2. Seepage, discoloration or other damage to parts of the building, its finish, or furnishings due to Contractor's failure to properly clean piping systems or duct systems shall be repaired without cost to the Owner.

B. Factory Finishes:
   1. Clean items with factory finishes. Touch up bare places, scratches and other minor damage to finishes. Use only factory-supplied paint of matching color and formula. If finishes are badly damaged or if there are many damaged, scratched or bare places, refinish the entire item.
C. Ice Rink System Commissioning:

1. Secondary Refrigerant Circuit Initial flushing:
   a. The permanent facility pumps may be used. Leakage from pump seals or other damage resulting from circulating unclean water or system debris shall require immediate rectification at no additional cost to the Owner.
   b. Fill entire system with clean water to normal charge. Start first circulation pump and run for a minimum of four hours, shut off first circulation pump, isolate and remove start up screen. Run second circulation pump for four hours, isolate and remove start up screen. Remove all water from system flush with air pressure until all possible water has been removed prior charging system with secondary coolant.

3.8 TESTING ICE SYSTEMS

A. Test all systems and equipment installed to demonstrate proper operation.

B. Advise Engineer of scheduled systems testing and completed system demonstration/operation schedules so that he may witness, if desired.

C. Correct and retest work found defective when tested.

D. Make repairs to piping systems with new materials. Peening, doping, or caulking of joints or holes will not be acceptable.

E. Steel Ice System and Ice Matt Glycol Piping: Air pressure test piping at 60 psig pressure for a period of six hours without evidence of leaking.

F. R407 Testing:
   1. High Side Testing – R407 to 225 psi, dry nitrogen
   2. Low Side Testing – R407 to 220 psi, dry nitrogen

G. Evacuation: Isolate sections of refrigeration system for evacuation. Install vacuum pump and evacuate system to below 700 microns. Break vacuum with dry nitrogen to a positive pressure and conduct second evacuation again to below 700 microns. Isolate vacuum pump from system and hold test to below 700 microns for 1 hour. If test does not hold, continue running pump until test passes on all components and piping of the refrigeration system prior charging system with R717.

H. Testing Reports: Submit reports for the above testing and evacuation. Test and evacuation reports should include the specific portion of the system being testing, the date of the test, and duration of the test and then be signed and witnessed for each test and evacuation.

3.9 SYSTEM STARTUP

A. After evacuation of the primary refrigerant side of the system provide a complete operating charge of R407A. Provide an additional 60# of refrigerant in canisters on site for any immediate loss of charge during the warranty period. The contractor shall be responsible for all loss of refrigerant from the refrigeration package during the warranty period and provide service to repair any leaks.

B. After testing completion and system inspection by the engineer the system shall be charged with inhibited ethylene glycol to a concentration of 40% glycol and 60% water. The air shall be removed from the system and monitored by the contractor for the next 4 months after system
startup. All air to be removed by the contractor during this period and any required addition of glycol to be by the contractor as air is removed.

C. Provide final glycol sample to testing agency, obtain written report and submit with final documents.

D. Provide a certified factory trained technician to perform the refrigeration package start up, for a minimum of 3 consecutive days.

E. Provide a minimum of 4 days on site to train owner’s staff on the system operation and assist in the first ice making.

F. Review operation and maintenance manuals with owner’s staff.

3.10 WORK INCLUDED

A. Ice system contractor shall provide all materials and perform the work required for a complete operable ice rink refrigeration system for a rink that is 192’ x 100’ including but not limited to the following:

1. Remove the existing dasherboard system as currently installed. Dasherboard players and penalty boxes to remain if option for new is not accepted.

2. Existing rink netting to be removed or raised to allow installation of new ice rink system. New rink floor to be 15’ narrower than the existing and final netting installation to reflect new layout of 100’ wide.

3. Remove and dispose of existing calcium chloride charge in rink floor, the mechanical room, and all interconnecting piping. Provide documentation that charge was taken to proper disposal facility.

4. Demolish as required and as shown on the drawings, the existing rink slab to allow the installation of the new matt system headers and transmission piping from the piping tunnel alongside of the rink, and to allow the installation of the new curbing for dasherboard supports.

5. Demolish as required and as shown on the drawings, the existing distribution manifolds located in the tunnel alongside the rink.

6. Core drill through tunnel wall to demolished rink slab to allow installation of rink transmission piping.

7. Remove concrete floor in the ice resurfacer room as shown on the drawings, excavate and core drill subsurface wall as required to allow installation of rink transmission piping from the ice resurfacer room to the tunnel for installation of transmission piping.

8. Furnish and install structural steel supports for the support of the new refrigeration package as shown on the drawings.

9. Furnish and install the outdoor refrigeration package as specified with all heat exchangers, compressors, motors, air cooled condenser, pumps, piping, insulation and controls. Package to be located on the roof as shown on the drawings.

10. Furnish and install horizontal expansion tank at the highest point in the system for air removal.

11. Furnish and install transmission piping from the refrigeration package on the roof to the rink floor matt system as shown on the drawings.

12. Furnish and install new curbing alongside rink as shown on the drawings to support dasherboard system. Curb to contain reinforcing steel, be doweled into existing slabs as shown and provide sleeves for connections from matt headers to matt sub-headers.

13. Furnish and install rink floor matt system as specified and as shown on the drawings. Matt shall be continuous throughout rink floor to maintain quality ice over the entire ice sheet and especially at rink edges and radius. Matt to have anchoring cable around the rink as required maintaining spacing and coverage after matt is chilled to ice making temperature.
14. Furnish and install new dasherboard system around the rink as specified and as shown on the drawings, including reinstallation of netting above dasherboards.
15. Provide all testing of system as specified.
16. Provide all required electrical feeds from electrical room to the refrigeration package and all package electrical starters, disconnects and controls as specified.
17. Furnish and install all primary and secondary refrigerant charges for the ice system.
18. Insulate all transmission piping and rink matt headers as indicated on drawings and specified.
19. Provide two year warrant as specified.

END OF SECTION
SECTION 01 35 28 – RESPIRATORY PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. Instruct and train each worker involved in asbestos/lead abatement, removal of hazardous chemical, or maintenance and repair of non-friable asbestos-containing materials or lead-based paint surfaces in proper respiratory use and require that each worker always wear a respirator, properly fitted on the face in the Work Area from the start of any operation which may cause airborne asbestos fibers, lead dust or chemical vapors until the Work Area is completely decontaminated. Use respiratory protection appropriate for the fiber, dust or chemical vapor level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered:

1. For this project a minimum of half-face respiratory protection with HEPA and other appropriate combination cartridges will be allowed as long as the contractor can document by airborne asbestos fiber count, lead dust or chemical vapor data included as part of a negative exposure assessment per OSHA that this respirator is appropriate based on the hazard. If the contractor cannot provide this documentation, then a powered air purifying respirator (PAPR) will be required.

1.3 STANDARDS

A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement:

5. NIOSH - National Institute for Occupational Safety and Health.

1.4 SUBMITTALS

A. Before Start of Work submit the following to the Environmental Consultant/Project Designer in bound manual for review and do not begin work until these submittal have
been reviewed: product data; medical monitoring certification; current training
certificates, and fit testing.

B. Product Data: Submit manufacturer's product information for each component used,
including NIOSH Certifications for each component in an assembly and/or for entire
assembly.

C. System Diagram: When a Type "C" supplied air respiratory system is required by the
work, submit drawing showing assembly of components into a complete supplied air
respiratory system. Include diagram showing location of compressor, filter banks,
backup air supply tanks, hose line connections in Work Area(s), routing of air lines to
Work Area(s) from compressor.

D. Operating Instruction: Submit complete operating and maintenance instructions for all
components and systems as a whole. Submittal is to be in bound manual form suitable
for field use.

E. Respiratory Protection Program: Asbestos Contractor shall maintain a written respiratory
protection program manual as required by OSHA. Contractor shall maintain a copy of all
applicable OSHA health and safety programs as required by OSHA regulations.

F. Resume information: Submit resume and information on training for individual
monitoring the operation of supplied air respiratory systems. Submit training
certifications where applicable.

PART 2 - EQUIPMENT

2.1 AIR PURIFYING RESPIRATORS

A. Respirator Bodies: Provide half face or full face type respirators. Equip full face
respirators with a nose cup or other anti-fogging device as would be appropriate for use
in air temperatures less than 32°F.

B. Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH
Certification for "Radio nuclides, Radon Daughters, Dust, Fumes, Mists including
Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2
(1980). In addition, a chemical cartridge section may be added, if required, for solvents,
chemicals, etc., in use. In this case, provide cartridges that have each section of the
combination canister labeled with the appropriate color code and NIOSH Certification.

C. Non-permitted respirators. Do not use single use, disposable or quarter face respirators.

PART 3 - EXECUTION

3.1 GENERAL

Respiratory Protection" and OSHA 29 CFR 1910 and 1926.

B. Require that respiratory protection be used at all times that there is any possibility of
disturbance of asbestos-containing materials whether intentional or accidental.

C. Require that a respirator be worn by anyone in a Work Area at all times, regardless of
activity, during a period that starts with any operation which could cause airborne fibers
until the area has been cleared for re-occupancy in accordance with Section 013528.

D. Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.

E. Do not allow the use of single-use, disposable, or quarter-face respirators for any purpose.

3.2 FIT TESTING

A. Initial Fitting: Provide initial fitting of respiratory protection during a respiratory protection course of training. Fit types of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing have been provided.

B. On a Weekly Basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube.

C. Upon Each Wearing: Require that each time an air-purifying respirator is put on it be checked for fit with a positive and negative pressure user seal check in accordance with the manufacturer's instructions or ANSI Z88.2 (1980).

3.3 TYPE OF RESPIRATORY PROTECTION REQUIRED

A. Provide Respiratory Protection as indicated in paragraph below. Where paragraph below does not apply, determine the proper level of protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the permissible exposure limit (PEL) is the minimum level of protection allowed.

B. For this project a minimum of half-face respiratory protection will be allowed as long as the contractor can document by airborne asbestos fiber count data (negative exposure assessment) that this respirator is appropriate based on the hazard. If the contractor cannot provide this documentation then a minimum powered air purifying respiratory protection will be required.

3.4 PERMISSIBLE EXPOSURE LIMIT (PEL)

A. Eight (8) Hour Time Weighted Average (TWA) and Excursion Limit (EL) concentration of asbestos fibers to which any worker may be exposed shall not exceed the following:

1. PEL of 0.1 fibers/cubic centimeters.
2. EL of 1.0 fibers/cubic centimeters.

B. Eight (8) Hour Time Weighted Average (TWA) and Action Level (AL) concentration of asbestos fibers to which any worker may be exposed shall not exceed the following:

1. PEL of 50 micrograms/cubic centimeters.
2. AL of 30 micrograms/cubic centimeters.

C. Permissible Exposure Limits (PEL) based on eight (8) hour time weighted average (TWA) and Ceiling Limits (C) concentrations of chemicals and solvents used or removed as part of this project. See OSHA regulations per chemical.
3.5 RESPIRATORY PROTECTION FACTOR - OSHA Table I 1926.1101

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<td>Negative pressure respirator</td>
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<tr>
<td>High efficiency filter</td>
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<td>Powered Air Purifying (PAPR):</td>
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<td>Positive pressure respirator</td>
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<tr>
<td>High efficiency filter</td>
<td></td>
</tr>
<tr>
<td>Half face piece</td>
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</tbody>
</table>

3.6 AIR PURIFYING RESPIRATORS

A. Negative pressure - half or full face mask: Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the work day. Require that respirators be wet-rinsed, and filters discarded, each time a worker leaves the Work Area. Require that new filters be installed each time a worker re-enters the Work Area. Store respirators and filters at the job site in the changing room and protect totally from exposure to asbestos prior to their use.

B. Powered air purifying – half or full face mask: Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement. Require that regardless of flow, filter cartridges be replaced after forty (40) hours of use. Require that HEPA elements in filter cartridges be protected from wetting during showering. Require entire exterior housing of respirator, including blower unit, filter cartridges, hoses, battery pack, face mask, belt, and cords, and be washed each time a worker leaves the Work Area. Caution should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

END OF SECTION 01 35 28
PART I - GENERAL

1.01 APPLICABILITY
   A. Pursuant to the Owner’s National Pollutant Discharge Elimination System (NPDES) Permit ILR400523 that authorizes discharges from its small Municipal Separate Storm Sewer System (MS4), the Owner must comply with the storm water requirements of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations, and the Clean Water Act. In accordance with the following Construction Site Enforcement Policy, Contractors and Professional Services Consultants are subject to enforcement by the Owner for failure to comply with these requirements.

1.02 RELATED SECTIONS
   A. Section 01 74 13 – Progress Cleaning

1.03 SUMMARY OF ENFORCEMENT POLICY
   A. In most cases, good communication can foster compliance and maintain goodwill thereby eliminating the need for an enforcement remedy.
   B. If the Owner determines that noncompliance warrants enforcement action, the Owner will select an enforcement remedy based on the nature and severity of the violation(s), the urgency with which remedial activity must be taken, whether the subject party has taken good-faith measures to come into compliance, and whether the violation is a repeat offense.
   C. A repeat offense is a violation by the same Contractor of the same requirement within the same calendar year as the original violation.
   D. When necessary and as appropriate, the Owner will impose a Storm water Violation Enforcement Remedy by increasing order of severity as follows:
      1. Warning
      2. Notice of Non-Compliance.
      3. Stop Work Order, Stop Payment, Back Charge.
      4. Referral to Illinois Environmental Protection Agency.
   E. Some of the more common violations that will trigger an enforcement remedy by increasing order of severity include:
      1. Emergency Situations.
      2. Failure to prepare a Storm Water Pollution Prevention Plan (SWPPP).
      3. Failure to comply with SWPPP measures.
      4. Failure to conduct site inspections.
      5. Failure to correct a violation.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
SECTION 01 35 44 – DECONTAMINATION UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including other Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Provide separate Personnel and Equipment Decontamination facilities. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Polyethylene Sheet: Provide a full 6 mil poly sheeting.

B. Duct Tape: Provide duct tape in 2 in. or 3 in. widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

C. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

D. Filters: Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter:

1. Primary Filter - Passes particles 20 microns and smaller.
2. Secondary Filter - Passes particles 5 microns and smaller.

E. Hose Bib: Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4 in. National Standard male hose outlet.

F. Shower Stall: For Wash Down Station provide leak tight shower enclosure with integrated drain pan fabricated from fiberglass or other durable waterproof material, approximately 3 ft x 3 ft sq. with minimum 6 ft high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4 ft-0 in. above drain pan. Connect drain to a reservoir, pump water from reservoir through filters to a sanitary sewer drain. Mount filters inside shower stall on back wall beneath hose bib. Provide both hot and cold water.

G. Provide approved water heater for hot water. Temperature control of the water shall be at the shower head.

H. Lumber: Construction grade 2 in. x 4 in. framing, and 4 ft x 8 ft plywood sheathing.
I. Shower Filter System: Provide shower filter system sized to accommodate the number of persons and showers on site. Filter system must have a pump and two (2) filters at a minimum. One (1) filter for large particles and one (1) 5 micron filter prior to discharge. Contaminated water must not be allowed to leak from shower pan.

J. Water Heater: Provide water heater as required. Water heater shall be according to code.

PART 3 - EXECUTION

3.1 PERSONNEL DECONTAMINATION UNIT (for asbestos and lead abatement)

A. Provide an attached personnel three (3) chamber decontamination unit consisting of a serial arrangement of connected rooms or spaces (Changing Room, Shower Room, and Equipment Room):

1. Require all persons without exception to pass through this Decontamination Unit for entry into and exiting from the Work Area for any purpose.
2. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 100 foot candles.

B. Changing Room (clean room): Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing:

1. Construct using 2 in. x 4 in. wood framing, plywood, and two (2) layers of polyethylene sheeting at least 6 mil in thickness, to provide an airtight seal between the Changing Room and the rest of the building.
2. Locate so that access to Work Area from Changing Room is through Shower Room.
3. Separate Changing Room from the building by flapped doors. See 3.3.C of this Section.
4. Require workers to remove all street clothes in this room, dress in clean, disposable coveralls, and don respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require Workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.
5. Provide adequate supply of towels.
6. Maintain floor of changing room dry and clean at all times. Do not allow overflow water from shower to wet floor in changing room.
7. Damp wipe all surfaces after each shift change with a disinfectant solution.
8. Remove waste generated in changing rooms, such as wet towels, and place in asbestos waste bags. Remove and seal waste bags appropriately at the end of each shift and dispose of in asbestos dumpster.
9. Provide posted information for all emergency phone numbers and procedures.
10. Provide entry and exit procedures through decontamination unit.
11. Provide a lockable door to restrict access into abatement area. Provide keys to Using Agency and APM/ASP.

C. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room:
1. Construct room by providing a shower pan and two (2) shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining floor in shower pan at elevation of top of pan.

2. Construct using 2 in. x 4 in. wood framing, plywood, and two (2) layers of polyethylene sheeting at least 6 mil in thickness, to provide an airtight seal between the Shower Room and the rest of the decontamination unit.

3. Provide splash proof entrances from the Shower Room. See 3.3.C of this section for flapped door.

4. Provide shower head and controls. Control of the temperature of the water shall be at the shower head.

5. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower.

6. Provide a soap dish and a continuously adequate supply of soap and shampoo. Maintain in sanitary condition.

7. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.

8. Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the Work Area.

9. Provide flexible hose shower head.

10. Pump waste water to sanitary sewer drain. If pumped to drain, provide 20 micron and 5 micron waste water filters in line to drain or waste water storage. Change filters daily or more often if necessary. Locate filters inside shower unit so that water lost during filter changes is caught by shower pan.

11. Provide hose bib.

12. Provide all other items indicated on contract drawings.

D. Equipment Room: Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers:

1. Separate this room from the Work Area by a 6 mil polyethylene flapped doorway. See 3.3.C of this section.

2. Construct using 2 in. x 4 in. wood framing, plywood, and two layers of polyethylene sheeting at least 6 mil in thickness, to provide an airtight seal between the Equipment Room and the containment or decontamination unit.

3. Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic and one (1) drop cloth layer of sheet plastic at all times. Use only clear plastic to cover floors.

4. Remove waste generated in equipment room, such as disposable clothing, towels, and respirator cartridges, and place in asbestos waste bags. Remove and seal waste bags appropriately at the end of each shift and dispose of in asbestos dumpster.

E. Work Area: Separate Work Area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the Work Area is expected to be high, add an intermediate cleaning space between the Equipment Room and the Work Area. Damp wipe clean all surfaces in the intermediate space after each shift change. Provide one additional floor layer of 6 mil polyethylene per shift change and remove contaminated layer after each shift in the intermediate space.
F. Decontamination Sequence: Require that all workers adhere to the following sequence when entering or leaving the Work Area:

1. Entering Work Area: Worker enters Changing Room and removes street clothing, puts on clean disposable coveralls and respirator, and passes through the Shower Room into the Equipment Room:
   a. Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.
   b. Worker proceeds to Work Area.

2. Exiting Work Area:
   a. Before leaving the Work Area, require the worker to remove all gross contamination and debris from coveralls and feet.
   b. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment.
   c. Extra work clothing such as boots, hard hats, goggles, and gloves are to be stored in contaminated end of the Equipment Room.
   d. Disposable coveralls are placed in a bag for disposal with other material.
   e. Require that Decontamination procedures found in Section 013543 be followed by all individuals leaving the Work Area.
   f. After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

3.2 EQUIPMENT DECONTAMINATION UNIT (for asbestos and lead abatement)

A. Provide attached Equipment Decontamination Units consisting of a serial arrangement of rooms, Wash Room and Holding Room for removal of equipment and ACM waste from Work Area. Do not allow personnel to enter or exit Work Area through Equipment Decontamination Unit.

B. Wash Room: provide wash room for cleaning of bagged or containerized asbestos-containing waste materials and equipment passed from the Work Area:

1. Construct wash room of nominal 2 in. x 4 in. wood framing, plywood, and two layers of polyethylene sheeting, at least 6 mil in thickness and located so that materials, after being wiped clean, can be passed to the Holding Room. Provide a lockable door to restrict access into abatement area. Provide keys to Using Agency and APM/ASP.
2. Separate this room from the Work Area by triple flapped doors of 6 mil polyethylene sheeting.
3. Provide a drop cloth layer of plastic on floor in the Wash Room for every load-out operation. Roll this drop cloth layer of plastic from Wash Room into Work Area after each load-out. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

C. Holding Room: Provide Holding Room as a location for double bagging single bagged asbestos-containing materials passed from the Wash Room:
1. Construct wash room of nominal 2 in. x 4 in. wood framing, plywood, and two layers of polyethylene sheeting, at least 6 mil in thickness and located so that materials, after being wiped clean, can be passed to the Holding Room.

2. Provide a lockable door to restrict access into abatement area. Provide keys to Using Agency and APM/ASP.

3. Separate this room from the adjacent rooms by triple flap doors fabricated from 6 mil polyethylene sheeting.

D. Decontamination Sequence: Take all equipment or ACM waste from the Work Area through the Equipment Decontamination Unit according to the following procedure:

1. Thoroughly wet clean equipment and/or ACM waste in sealed polyethylene bags and pass into Wash Room.

2. When passing equipment or ACM waste into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the Wash Room doorway. Keep all outside personnel clear of the Equipment Decontamination Unit.

3. Once inside the Wash Room, wet clean the ACM waste and/or equipment.

4. When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Wash room and the Holding Room.

5. Single bagged waste is to be double bagged in the Holding Room and passed to the exterior. See Section 020800.

6. Workers from the building exterior transport ACM waste for disposal and decontaminated equipment for storage.

7. Require these workers to wear full protective clothing and appropriate respiratory protection.

8. At no time is a worker from an uncontaminated area to enter the Equipment Decontamination Unit when a removal worker is inside.

3.3 CONSTRUCTION OF THE DECONTAMINATION UNITS

A. Walls and Ceiling: Construct airtight walls and ceiling using two (2) layers of 6 mil polyethylene sheeting, at least 6 mil in thickness attached to 2 in. x 4 in. wood framing and plywood for walls and ceiling. Provide a lockable door to restrict access into abatement area. Provide keys to Using Agency and APM/ASP.

B. Floors: Use two (2) layers (minimum) of 6 mil polyethylene sheeting to cover floors in all areas of the Decontamination Units. Place one (1) layer of 6 mil poly for drop cloths to be removed at the end of each shift. Contractor shall be responsible for damages to equipment and finishes.

C. Flap Doors: Fabricated from three (3) overlapping sheets with openings a minimum of 3 ft wide. Configure so that sheeting overlaps adjacent surfaces. Weight sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of 3 ft between entrance and exit of any room. Provide a minimum of 3 ft between doors to airlocks.

D. If the Decontamination area is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/2 in. plywood "ceiling" with polyethylene sheeting, at least 6 mil in thickness covering the top of the "ceiling."

E. Visual Barrier: Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil in
thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting. Construct barrier with wood or metal studs covered with minimum 1/2 in. plywood or gypsum board. Where the solid barrier is provided, sheeting need not be opaque.

F. Electrical: Provide subpanel at Changing Room to accommodate all removal equipment. Power subpanel directly from a building electrical panel. Connect all electrical branch circuits in Decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.

3.4 CLEANING OF DECONTAMINATION UNITS

A. Clean debris and residue from inside of Decontamination Units on a daily basis or as otherwise indicated on Contract Drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

3.5 SIGNS

A. Post an approximately 20 in. x 14 in. manufactured danger sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Provide spacing between respective lines at least equal to the height of the respective upper line.

3.6 HYGIENE FACILITIES/DECONTAMINATION FOR BRINE SOLUTION

A. Provide decontamination and hygiene facilities for workers involved in removing the brine solution as required per OSHA regulations.

END OF SECTION 01 35 43
PART I - GENERAL

1.01 RELATED DOCUMENTS
   A. Exhibit 01 35 46-1, Example Indoor Air Quality Management Plan

1.02 SUBMITTALS
   A. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality; use SMACNA IAQ Guideline for Occupied Buildings Under Construction.
      1. Submit IAQ Plan at pre-construction meeting. See Exhibit 01 35 46–1, Example Indoor Air Quality Management Plan.
      2. Identify construction activities likely to produce odor or dust.
      3. Identify areas of project potentially affected, especially occupied areas.
      4. Evaluate potential problems by severity and describe methods of control.
      5. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
      6. Describe cleaning and dust control procedures.
      7. Describe commissioning procedure.
      8. Identify interior finishes that generate odors, moisture, or vapors or are susceptible to absorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 IMPLEMENTATION

3.02 AN INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN FOR THE CONSTRUCTION AND PRE-OCCUPANCY PHASES OF THE BUILDING AS FOLLOWS:
   A. Controls, sequences, permanent equipment/systems shall meet the Design Intent / Basis of Design in accordance with the Project’s schedule without imposing hardship to the Commissioning requirements and schedule.
   B. Meet the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, Chapter 3.
      1. Protect stored on-site or installed absorptive materials from moisture damage.
         a. HVAC equipment and supply air ductwork shall not be used for ventilation during construction without meeting the following criteria as specified in the IAQ.
            1) Meet all requirements of Section 01 76 00 - Protecting Installed Construction.
               (a) Coordinate with the Ventilation Contractor to avoid the use of return air ducting.
                  (1) Seal return air inlets or otherwise positively isolate return air system to prevent recirculation of air; provide alternate return air pathways.
                  (2) If the Permanent Design does not permit temporary isolation of Return Ducting then filtration media with a Minimum Efficiency Reporting Value (MERV) of 11 shall be used at each return air grill.
                  (3) Within Design parameters, operate HVAC system on 100 percent outside air.
                  (4) Ensure that all air filters are correctly installed prior to starting use. Replace all filtration media at a minimum of weekly or sooner as necessary to maintain cleanliness. Replace all filtration immediately prior to occupancy. Provide filtration media having a Minimum Efficiency Reporting Value as scheduled.
   C. Prior to permanent use of return air ductwork without intake filters, clean up and remove dust debris generated by construction activities using a HEPA vacuum cleaning system.
   D. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
E. Prevent the absorption of moisture by:
   1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
   2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
   3. Provide sufficient TEMPORARY ventilation for drying. Permanent equipment may be allowed to be used once all Contractor-submitted care provisions have been approved by Owner.

F. Begin construction ventilation only when building envelope is sealed.

G. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.

END OF SECTION
1. **GENERAL**

1.1 **REQUIREMENTS INCLUDE**

A. Each Contractor shall comply with all laws, rules and regulations governing the work.

1. When Contractor observes that contract documents are at variance with specified codes, notify Professional Services Consultant in writing immediately. As necessary Professional Services Consultant will process change in accord with General Conditions.

2. When Contractor performs any work knowing or having reason to know that the work is contrary to such laws, rules and regulations and fails to so notify the Professional Services Consultant, Contractor shall pay all costs arising therefrom. However, it will not be the Contractor's primary responsibility to make certain that the contract documents are in accord with such laws, rules and regulations.

1.2 **DEFINITIONS & ABBREVIATIONS**

A. Definitions: The following are working definitions of the terms as used within this project manual.

1. **Regulations:** Regulations are rules or statutory requirements of government agencies such as the Federal Government, the State of Illinois and the University of Illinois.

2. **Codes:** Codes are sets of rules and guidelines for design, prepared by a designated governmental and/or professional group, which are intended to protect public safety and welfare. Some Standards are recognized as Codes.

3. **Standards:** Standards are requirements set by authorities, custom or general consent and established as criteria by the U of I.

4. **Authority Having Jurisdiction (AHJ):** The U of I is the AHJ on Code interpretation. The Associate Director for Code Compliance and Fire Safety serves as the AHJ for the Urbana campus.

1.3 **QUALITY ASSURANCE**

A. Professional Services Consultant has designed the project with full knowledge of code requirements and has copies of all specified codes available for Contractor's inspection.

B. Each Contractor:
1. Ensure that copies of specified codes and standards are readily available to contractor's personnel. Copies are available at Contractor's expense from source or publisher.

2. Ensure that Contractor's personnel are familiar with workmanship and installation requirements of specified codes and standards.

1.4 REGULATORY REQUIREMENTS

A. Source and requirements:

1. DOT (Department of Transportation):
   a. Labeling requirements for Special Wastes (Class 9) and hazardous wastes.

2. IDPH (Illinois Department of Public Health):
   a. Illinois Asbestos Abatement Act (Illinois Revised Statues, ch. 122, ar. 1401 et. seq.).

3. IEPA/USEPA (Environmental Protection Agency):
   a. Air Pollution, Land and Water Standards.

4. OSHA (Occupational Safety and Health Administration) & Illinois Department of Labor/Illinois OSHA:

5. OSFM (Office of the State Fire Marshal)

1.5 The Professional Services Consultant or UIUC may reference other codes or standards throughout the Project Manual when deemed appropriate for proper compliance with regulatory requirements.

END OF SECTION 01 41 00
Section 01 42 00 – DEFINITIONS ACM, LEAD & HAZARDOUS WASTE

PART 1 – GENERAL

1.1 DEFINITIONS RELATED TO ASBESTOS ABATEMENT

ABATEMENT
a procedure to control fiber release from asbestos-containing materials or dust from lead surfaces. This includes removal, encapsulation, enclosure, and repair.

ACTION LEVEL
Lead air samples cannot exceed 30 µg/m³

AGGRESSIVE SAMPLING
a method of sampling in which the person collecting the air sample creates activity during the sampling period to stir up settled dust and simulate the activity of that area of the building.

AIR CELL
insulation normally used on pipes and duct work that is comprised of corrugated cardboard which is frequently combined with asbestos and cellulose or refractory binders.

AIR LOCK
a system for permitting entrance and exit with minimum air movement. Consisting of two curtained doorways separated by a distance of at least three (3) feet such that one passes through one doorway into the air lock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

AIR MONITORING
the process of measuring the fiber content of a specific volume of air in a stated period of time.

AIR SAMPLING
the process of measuring the fiber or dust content of a known volume of air collected during a specific period of time.

AMENDED WATER
water to which a surfactant has been added to improve penetration and reduce fiber release.

ANSI
American National Standards Institute, 1430 Broadway, New York, New York 10018.

AREA AIR SAMPLING
any form of air sampling or monitoring where the sampling device is placed at some stationary location. Area air sampling is conducted each day during an asbestos abatement project. Sampling locations include: inside the work area, outside the work area, and outside the building.

ASBESTOS
a naturally occurring mineral. The types of asbestos are amosite, chrysotile, crocidolite, anthophyllite, tremolite, and actinolite.

ASBESTOS CONTAINING MATERIAL (ACM)
material composed of asbestos of any type and in an amount greater than one percent (1%).

ASBESTOS CONTAINING BUILDING MATERIAL (ACBM)
surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.
**ASBESTOS CONTAINING WASTE MATERIAL**
any material which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.

**ASBESTOS DEBRIS**
pieces or dust particles of ACBM that have been identified by an accredited inspector to be ACM.

**ASTM**

**AUTHORIZED VISITOR**
the building owner, the owner's representative, testing lab personnel, the architect/engineer, emergency personnel or a representative of any federal, state and local regulatory or other agency having authority over the project.

**BACKGROUND LEVEL MONITORING**
a method used to determine airborne asbestos fiber concentrations inside and outside a building prior to starting an asbestos abatement project.

**BARRIER**
any surface that seals off the work area to inhibit the movement of fibers or unauthorized persons from entering the work area.

**BREATHEING ZONE**
a hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

**CLEAN ROOM**
an uncontaminated area or room which is a part of the decontamination (decon) enclosure with provisions for storage of workers' street clothes and protective equipment.

**CLEARANCE AIR MONITORING**
the employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers upon conclusion of an asbestos abatement project.

**CURTAINED DOORWAY**
a device which consists of at least three (3) overlapping sheets of plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side.

**CRITICAL BARRIER**
at a minimum one layer of six (6) mil poly placed over all penetrations from the asbestos removal area including, but not limited to, HVAC system, windows, door openings, etc.

**DECONTAMINATION UNIT (DECON)**
a series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers. The decon shall at a minimum consist of a change room, shower, and an equipment room. The decon must be lined inside and out with two (2) layers of six (6) mil poly. If constructed outside of the building it must be covered with plywood on the top and sides.

**DISPOSAL BAG**
properly labeled six (6) mil, leak-tight plastic bag used for transporting asbestos waste from work site to disposal site.

**ENCAPSULANT (SEALANT)**
a liquid material which can be applied to asbestos containing material and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

**ENCAPSULATION**
the coating or spraying of asbestos material with a sealant.
ENCLOSURE
the construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.

EPA
Environmental Protection Agency, 401 M. Street, SW, Washington, DC 20460.

EQUIPMENT ROOM
a contaminated area or room which is part of the decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.

EXCURSION LIMIT
1.0 f/cc - level that air sample results cannot exceed based on 30 minute sample.

FIXED OBJECT
a unit of equipment or furniture in the work area which cannot be removed from the work area.

FRIABLE ASBESTOS MATERIAL
material that contains more than 1.0% asbestos and can be crumbled, pulverized, or reduced to powder by hand pressure.

GLOVEBAG
a method for removing three (3) linear feet or less of friable ACM from heating, ventilation, and air conditioning (HVAC) ducts, short pipe runs, valves, joints, elbows, and other surfaces in an uncontained work area. The glove bag assembly is a manufactured device consisting of a glovebag (constructed of six (6) mil transparent plastic) two (2) inward-projecting long sleeve rubber gloves, one inward-projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glove bag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains fibers released during removal.

HAZWOPER
Hazardous waste operations and emergency response, OSHA standard for hazardous chemical removal and disposal procedures.

HEPA FILTER
a High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in diameter.

HEPA FILTER VACUUM COLLECTION EQUIPMENT (OR VACUUM CLEANER)
High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

LEAD-BASED PAINT
Lead that is equal to or greater than 1.0 mg/cm² or 0.5% (5,000 ppm or 5,000 mg/kg) by weight as defined by Title X of the 1992 Housing and Community Development Act (Title X is also known as the Residential Lead-based Paint Hazard Reduction Act of 1992).

LOAD-OUT
a series of two rooms, at a minimum, separated from the work area, and from each other by curtained doorways for the removal of waste bags and equipment.

MISCELLANEOUS MATERIALS
A material on structural members such as floor and ceiling tiles, that does not include surfacing material or thermal system insulation.

MOVEABLE OBJECT
a unit of equipment or furniture in the work area which can be removed from the work area.
NEGATIVE PRESSURE RESPIRATOR
a respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

NEGATIVE PRESSURE VENTILATION SYSTEM
a portable local exhaust system equipped with HEPA filtration. The system shall be capable of maintaining a constant, low velocity air flow from contaminated areas into adjacent uncontaminated areas, creating a negative pressure differential between the outside and inside of the work area.

NESHAP

NIOSH
National Institute for Occupational Safety and Health CDC - NIOSH Building, J N.E., Room 3007, Atlanta, GA.

OSHA
Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, DC 20210.

POLY
4- or 6- mil polyethylene sheeting

PERSONAL MONITORING
sampling of the asbestos fiber concentrations within the breathing zone of an employee.

PRESSURE DIFFERENTIAL AND VENTILATION SYSTEM
a local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the Work Area at a lower pressure than any adjacent area, and which cleans recirculated air or generates a constant air flow from adjacent areas into the Work Area.

PROTECTION FACTOR
the ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

REMOVAL
all procedures necessary to strip all asbestos containing materials or lead from the designated areas and to dispose of these materials at an acceptable site.

REPAIR
returning damaged ACBM to an undamaged condition or to an intact state so as to prevent fiber release.

RESPIRATOR
a device designed to protect the wearer from the inhalation of harmful atmospheres.

SHOWER ROOM
a room between the clean room and the equipment room in the decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.

STABILIZE
returning damaged lead paint surfaces to an undamaged condition or to an intact state so as to prevent dust or paint chip release.

SURFACING MATERIALS
a material that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.
SURFACTANT
a chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

THERMAL SYSTEM INSULATION (TSI)
a material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

VISIBLE EMISSIONS
any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

WET CLEANING
the process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

WORK AREA
the area where asbestos related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

END OF SECTION 01 42 00
PART 1 GENERAL

1.01 DESCRIPTION OF TEMPORARY UTILITY SYSTEMS

A. SECTION INCLUDES
1. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

B. TEMPORARY ELECTRICITY
1. If it is not possible to use the building's meter, a temporary meter shall be installed. This temporary meter shall meet the reliability and accuracy requirements of the Owner as specified in the Contract Documents, and will be subject to verification by the Owner.
2. Connect to Owner's existing power service.
   a. Do not disrupt Owner's need for continuous service.
   b. Exercise measures to conserve energy.
3. Complement existing power service capacity and characteristics as required.
4. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
5. Provide main service disconnect and over-current protection at convenient location and meter.
6. Permanent convenience receptacles may be utilized during construction.
7. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

C. TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES
1. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
2. Permanent building lighting may be utilized during construction.

D. TEMPORARY HEATING
1. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
2. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
3. Owner's existing heat plant may be used.
4. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

E. TEMPORARY COOLING
1. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
2. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
3. Owner's existing cooling plant may be used.
4. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
5. Provide temporary dehumidification during installation of finishes as required to maintain conditions

F. TEMPORARY VENTILATION
1. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

G. TEMPORARY WATER SERVICE
1. Connect to existing water source.
   a. Exercise measures to conserve water.
b. Identify outlets for nonpotable water. Contractor is NOT to use facilities sinks or drains to dispose of nonpotable water.

H. TEMPORARY TOILETS:
1. Provide temporary toilet facilities for use of all workmen and authorized parties throughout construction period. Provide temporary
2. Provide a minimum number of enclosed combination toilet and urinal units for construction personnel.
   a. One for every 20 employees, or fraction thereof.

I. USE OF PERMANENT AIR HANDLING UNIT (AHU) SYSTEMS FOR CONSTRUCTION PURPOSE.
1. The use of permanently installed air handling units (AHUs) for temporary ventilating, heating and cooling during construction is only permitted as specified in the Contract Documents.
2. See Section 01 76 00 – Protecting Installed Construction for basic requirements that shall be met if permanent equipment is permitted to be used.
3. See Section 01 35 46 - Indoor Air Quality Procedures.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
1. **GENERAL**

1.1 **RELATED DOCUMENTS**

A. Drawings and general provisions of Contract, including other Division 1 Specification Sections, apply to work of this section.

1.2 **MONITORING**

A. Continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area.

1.3 **SUBMITTAL**

A. Before Start of Work: Submit design of pressure differential system to the Owner's Representative for review. Do not begin work until submittal is accepted by the Owner's Representative. Include in the submittal at a minimum:

1. Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines.
2. Description of projected air flow within Work Area and methods required to provide adequate air flow in all portions of the work area.
3. Description of methods of testing for correct air flow and pressure differentials.
4. Manufacturer's product data on the HEPA filtered fan units to be used.
5. Location of the machines in the Work Area.
6. Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power.
7. Description of work practices to insure that airborne fibers travel away from workers.
8. Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of Work Area.

1.4 **QUALITY ASSURANCE**

A. Monitor pressure differential at Personnel and Equipment Decontamination Units with a differential pressure meter. Each manometer must have a readable, printed tape. This original tape shall be submitted to the APM at the end of each shift and will become part of the PM report. Manometer shall remain in continuous operation along with negative air units until clearances are achieved:

1. Contractor shall show documentation of calibration of manometer as required by manufacturer.

**PART 2 - PRODUCT**

2.1 **HEPA FILTERED FAN UNITS**

A. General: Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Use units that meet the following requirements.

B. Cabinet: Constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 in. to fit through standard-size doorways. Provide units whose cabinets are:
1. Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance.
2. Arranged to provide access to and replacement of all air filters from intake end.
3. Mounted on casters or wheels.

C. Fans: Rate capacity of fan according to usable air-moving capacity under actual operating conditions.

2.2 HEPA FILTERS

A. Provide units whose final filter is the HEPA type with the filter media (folded into closely pleated panels) completely sealed on all edges with a structurally rigid frame:

1. Provide units with a continuous rubber gasket located between the filter and the filter housing to form a tight seal.
2. Provide HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 dioctylphthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.
3. Provide filters that are marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

B. Pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two (2) stages of pre-filtration are required. Provide units with the following pre-filters:

1. First-stage pre-filter: low-efficiency type (e.g., for particles 100 µm and larger).
2. Second-stage (or intermediate) filter: medium efficiency (e.g., effective for particles down to 5 µm).
3. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps.

C. Instrumentation: Provide units equipped with:

1. Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed.
2. A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge affixed near the gauge for reference, or the Magnehelic reading indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) air delivery at that point.
3. Elapsed time meter to show the total accumulated hours of operation.

D. Safety and Warning Devices: Provide units with the following safety and warning devices:

1. Electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter.
2. Automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge.
3. Warning lights to indicate normal operation (green), too high a pressure drop across the filters (i.e., filter overloading) (yellow), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge) (red).
4. Audible alarm if unit shuts down due to operation of safety systems.
E. Electrical components: Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL). Each unit is to be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be grounded.

F. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. Aerospace America, Inc. "Aero-Clean 2000"
   900 Truman Parkway
   P.O. Box 189
   Bay City, Michigan 48707
   P.O. Box 183
   Maple Shade, NJ 08052
   670 Mariner Drive
   Michigan City, Indiana 46360
4. Global Consumer Services, Inc. "Red Baron"
   1721 N. Highland Avenue
   Los Angeles, CA 90028
5. Tri-Dim Filter "ACCU-2M"
   1431 West Lake Street
   Chicago, Illinois 60607

PART 3 - EXECUTION

3.1 PRESSURE DIFFERENTIAL ISOLATION

A. Isolate the Work Area from all adjacent areas or systems of the building with a Pressure Differential that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area.

B. Relative Pressure in Work Area: Continuously maintain the work area at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of -0.02 in. of water:

1. Accomplish the pressure differential by exhausting a sufficient number of HEPA filtered fan units from the work area. The number of units required will depend on machine characteristics, the seal at barriers, and required air circulation. The number of units will increase with increased make-up air or leaks into the Work Area.
2. Exhaust a sufficient number of units from the work area to develop the required pressure differential.
3. Vent HEPA filtered fan units to outside of building.
4. Mount units to exhaust directly through disposable duct work.

3.2 AIR CIRCULATION IN THE WORK AREA

A. Air Circulation: For purposes of this section air circulation refers to either the introduction
of outside air to the Work Area or the circulation and cleaning of air within the Work Area:

1. Air circulation in the Work Area is a minimum requirement intended to help maintain airborne fiber counts at a level that does not significantly challenge the work area isolation measures. The Contractor may also use this air circulation as part of the engineering controls in his worker protection program.

B. Determining the Air circulation Requirements: Provide a fully operational air circulation system supplying a minimum of four air changes per hour and determine the number of units needed to achieve required air circulation.

3.3 EXHAUST SYSTEM

A. Exhaust all units from the Work Area to meet air circulation requirements of this section.

B. Location of HEPA Filtered Fan Units: Locate fan unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the HEPA filtered fan unit(s) at a maximum distance from the worker access opening or other makeup air sources. Do not place HEPA exhaust tubes on the south side of the building.

C. Place end of unit, an intake duct or its exhaust duct through an opening in the plastic barrier, window, or wall covering. Seal plastic around the unit or duct with tape. Each area must be provided adequate security to prevent a breach to the containment and/or facility.

D. Vent to Outside of Building - through windows on the west and north sides of the building. The vent shall be secured properly using plywood and wood framing.

E. Decontamination Units: Arrange Work Area and decontamination units so that the majority of make up air comes through the Decontamination Units. Use only personnel or equipment Decontamination Unit at any time and seal the other so that make up air passes through unit in use.

F. Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Owner's Representative by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Openings are to have a HEPA filter sealed in place to allow air to draw and to prevent any fibers from escaping the containment.

3.4 RE-CIRCULATION SYSTEM

A. Pressure differential isolation and air circulation in the Work Area are to be accomplished by a recirculation system as described below.

B. Recirculate air in the Work Area through HEPA filtered fan units to accomplish air circulation requirements of this section.

C. Location of Fan Units: Locate HEPA filtered fan units so that air is circulated through all parts of the Work Area, and so that required pressure is maintained at all parts of Work Area geometry. Move units as necessary so that in any location where asbestos-containing materials are being disturbed the discharge from one HEPA filtered fan unit is blowing contamination away from workers. Direct air flow in these locations so that it is
predominantly toward workers’ backs at the breathing zone elevation.

3.5 AIR CIRCULATION IN DECONTAMINATION UNITS

A. Pressure Differential Isolation: Continuously maintain the pressure differential required for the work area in the:

1. Personnel Decontamination Unit: across the Shower Room with the Equipment Room at a lower pressure than the Clean room.
2. Equipment Decontamination Unit: Across the Holding Room with the Wash Room at a lower pressure than the Clean Room.

B. Air Circulation: Continuously maintain air circulation in Decontamination Units at same level as required for Work Area.

C. Air Movement: Arrange air circulation through the Personnel Decontamination Unit so that it produces a movement of air from the Clean Room through the Shower Room into the Equipment Room.

3.6 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

A. General: Each unit shall be serviced by a dedicated minimum 115-Volt-20A circuit with ground fault circuit interrupter (GFCI) supplied from temporary power supply. Do not use existing branch circuits to power fan units.

B. Testing the System: Test pressure differential system before any asbestos-containing material is wetted or removed. After the Work Area has been prepared, the decontamination facility set up, and the fan unit(s) installed, start the unit(s) (one at a time). Demonstrate operation and testing of pressure differential system to University’s Representative:

1. The containment shall be smoke tested to ensure the proper operation of the pressure differential system. Smoke testing shall be conducted prior to the start of the removal and at least daily thereafter. Smoke tests shall be recorded by the Supervisor on the daily logs.

C. Demonstrate Condition of Equipment for each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of the following:

1. Squareness of HEPA Filter.
2. Condition of Seals.
3. Proper operation of all lights.
4. Proper operation of automatic shut down if exhaust is blocked.
5. Proper operation of alarms.
6. Proper operation of magnehelic gauge.
7. Proper operation and calibration on pressure monitoring equipment.

D. Demonstrate Operation of the pressure differential system to the Owner’s Representative will include, but not be limited to, the following:
1. Plastic barriers and sheeting move lightly in toward Work Area.
2. Curtain of decontamination units move lightly in toward Work Area.
3. There is a noticeable movement of air through the Decontamination Unit.
4. Use smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room.
5. Use smoke tubes to demonstrate a definite motion of air across all areas in which work is to be performed.
6. Use a differential pressure meter or manometer to demonstrate the required pressure differential at every barrier separating the Work Area from the balance of the building, equipment, and duct work or outside.

E. Modify the Pressure Differential System as necessary to demonstrate successfully the above.

F. Use of System During Abatement Operations:

1. Start fan units before beginning work (before any asbestos-containing material is disturbed). After abatement work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.
2. Do not shut down air pressure differential system during encapsulating procedures, unless authorized by the Owner's Representative in writing. Supply sufficient pre-filters to allow frequent changes.
3. Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and fan units are operating again.
4. At completion of abatement work, allow fan units to run as specified under section 017100, to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

G. Dismantling the System:

1. When a final inspection and the results of final air tests indicate that the area has been decontaminated, fan units may be removed from the Work Area. Before removal from the Work Area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 6 mil polyethylene to prevent environmental contamination from the filters.

END OF SECTION 01 51 30
PART I - GENERAL

1.01 CAMPUS PARKING AND VEHICULAR ACCESS

A. F&S Parking Department: Campus construction and utility projects, by nature, occupy and disrupt various parking facilities and services across campus. The F&S Parking Department oversees such facilities owned by the University of Illinois at Urbana-Champaign and is located at 1110 W. Springfield Avenue, Urbana, IL.

B. Arrangements for Use of University-Owned Parking Facilities: Any use of parking facilities on campus requires arrangements to be made in advance of space occupation. Vehicles or equipment occupying parking facilities without prior arrangement shall be subject to U of I parking regulations and enforcement.

C. Arrangements for Use of Municipally-Owned Parking Facilities: If a project disrupts parking owned by the City of Urbana or the City of Champaign, the project is responsible for securing permission to use municipal parking facilities, arrange for the bagging of meters, and payment of daily meter charges for said bagging.

D. Arrangements for Closure of Streets, Sidewalks, or Bicycle Facilities: If a project will require closure of any U of I streets, sidewalks, or bicycle facilities, see Section 01 35 00 – Special Procedures for information regarding traffic closures.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
PART I - GENERAL

1.01 SUMMARY

A. Asbestos Contractor provide and maintain suitable barriers to prevent unauthorized personnel or public entry, and to protect the work, existing facilities and utilities, trees and plants from construction operations.
   1. Remove when no longer needed at completion of work or as directed.

B. Use of Barriers and Enclosures: The Contractor shall furnish, erect and maintain temporary barriers, barricades, enclosures, and temporary construction fencing as required for the following:
   1. To protect the health and safety of occupants and the general public from exposure to immediate physical harm as well as to noise, dust, and fumes. Note that this Section does not provide minimum requirements related to Indoor Air Quality.
   2. To protect new and pre-existing adjacent construction from exposure to physical damage, dust, dirt, and water.
   3. To provide security of valuable property.
   4. To protect trees and plants.

PART 2 - PRODUCTS

2.01 GENERAL FABRICATION

A. Substantial Construction: Barriers and enclosures shall be of adequately substantial construction to serve their purpose without failure throughout the duration of their use. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards.

B. Rigid Fencing: The general public, as well as adjacent lawns and plantings, shall be protected from harm by the installation of continuous, durable, rigid fencing at the limit lines of each construction area.

C. Tree Protection: Existing trees that are adjacent to a construction site shall be protected from damage by the installation of durable, rigid 6 foot high fencing at the drip line of each tree.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Asbestos Contractor shall provide and maintain suitable barriers with signage to prevent unauthorized entry and to protect the work.

B. Asbestos Contractor shall provide temporary enclosures to separate work areas from existing building and from areas occupied by Owner.

C. Temporary enclosure shall consist of:
   1. Install a rigid enclosure around windows, exterior doors, and interior of the building using plywood and 2 x 4 wood studs.
   2. For the ground floor units, install separation barrier about three (3) feet away from the exterior wall to enclose the windows and doors.
      a. Provide adequate supports to hold the barrier in place for the entire duration of abatement and replacement.
   3. Place two (2) layers of six (6) mil poly on the exterior side of the enclosure sealing all edges and penetrations.

D. Asbestos Contractor shall coordinate with General Contractor when installing and removing the enclosure to ensure the interior of the building is always protected from the weather elements and unauthorized entry.

E. Install facilities of a neat and uniform appearance, structurally adequate for purposes, and according to applicable rules and regulations.

F. Maintain barriers during entire construction period. Barriers shall completely enclose the containment area to include personal and equipment decontamination units.
G. Asbestos Contractor shall not block any fire protection system or means of egress.

3.02 BASIC REQUIREMENTS

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.
B. Install barriers and enclosures so as to not create new hazards such as tripping or protrusions that might be a source of safety concern to pedestrians or passersby.
C. Establish reasonable alternative access when necessary due to placement of barriers.
D. Maintain barriers during entire construction period.
E. Relocate barriers as required by progress of construction.

3.03 TREE AND PLANT PROTECTION REQUIREMENTS

A. Preserve and protect existing trees and plants at site which are designed to remain, and those adjacent to site.
B. Consult with Construction Manager and the Owner for removal of agreed-on roots and branches which interfere with construction.
   1. Employ a qualified tree surgeon to remove, and to treat cuts.
C. Provide temporary barriers to a height of six feet, around each, or around each group, of trees and plants. The barriers shall be placed at the drip line of each tree.
D. Protect root zones of trees and plants:
   1. Do not allow vehicular traffic or parking.
   2. Do not store materials or products.
   3. Prevent dumping of refuse or chemically injurious materials or liquids.
   4. Prevent puddling or continuous running water.
E. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.
F. Replace, or suitably repair, trees and plants designated to remain which are damaged or destroyed due to construction operations. Any damage and any necessary replacements will be evaluated by F&S horticulturists.

3.04 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the Asbestos Project Designer.
B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations and procedures.
E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

1.03 SUBMITTALS
A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers’ standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
D. English Units
   1. All equipment, including pipe and fittings, shall be supplied in English units. The submittal of metric equivalents ONLY is not allowed.

PART 2 PRODUCTS

2.01 NEW PRODUCTS
A. Provide new products unless specifically required or permitted by the Contract Documents.
B. DO NOT USE products having any of the following characteristics:
   1. Made outside the United States, its territories, Canada, or Mexico.
   2. Made using or containing CFC's or HCFC's.
   3. Made of wood from newly cut old growth timber.
C. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 61 16.
   2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Result in less construction waste.
   6. Have a published GreenScreen Chemical Hazard Analysis.

2.02 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
D. MAINTENANCE MATERIALS
1. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
2. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES
   A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
   B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   C. A request for substitution constitutes a representation that the submitter:
      1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
      2. Will provide the same warranty for the substitution as for the specified product.
      3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
      4. Waives claims for additional costs or time extension that may subsequently become apparent.
   D. Substitution Submittal Procedure:
      1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
      2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
      3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING
   A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
   B. Transport and handle products in accordance with manufacturer's instructions.
   C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
   D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
   E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
   F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION
   A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
   B. Store and protect products in accordance with manufacturers' instructions.
   C. Store with seals and labels intact and legible.
   D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
   E. For exterior storage of fabricated products, place on sloped supports above ground.
   F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
   G. Prevent contact with material that may cause corrosion, discoloration, or staining.
   H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."
B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. VOC Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Carpet.
   3. Paints and coatings.
   5. Acoustical ceilings and panels.
   6. Cabinet work.
B. Interior of Building: Anywhere inside the exterior weather barrier.
C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

A. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.
B. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.; 2011.

1.05 SUBMITTALS

A. See Section 01 33 23 - Shop Drawings, Product Data and Samples for submittal procedures.
B. Evidence of Compliance: Submit for each different product in each applicable category.
C. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
B. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GreenSeal Certification.
C. Paints and Coatings: Provide products having VOC content as specified in Section 09 90 00.
D. Carpet Tile and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
C. Cutting and patching.
D. Surveying for laying out the work.
E. Cleaning and protection.
F. Demonstration and instruction of Owner personnel.
G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 31 00 - Project management and Coordination.
B. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
C. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.
D. Section 01 77 00 - Closeout Procedures and Requirements.
E. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
F. Section 01 78 00 - Operations and Maintenance Data.
G. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
H. Section 07 84 00 - Firestopping.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of Owner or separate Contractor.

1.05 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
B. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
1.06 PROJECT CONDITIONS
   A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
   B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
      1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
   C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
      1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.

1.07 COORDINATION
   A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
   B. Notify affected utility companies and comply with their requirements.
   C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
   D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
   E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
   F. Coordinate completion and clean-up of work of separate sections.
   G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS
2.01 PATCHING MATERIALS
   A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
   B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
   C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
   B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
   C. Examine and verify specific conditions described in individual specification sections.
   D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK
A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
F. Utilize recognized engineering survey practices.
G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and ________.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and ________.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.
B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction as indicated in Section 01 56 00.
C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

D. Services (Including but not limited to HVAC, Plumbing, and Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

H. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

I. Clean existing systems and equipment.

J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
K. Do not begin new construction in alterations areas before demolition is complete.
L. Comply with all other applicable requirements of this section.

3.06 CUTTING AND PATCHING
A. Whenever possible, execute the work by methods that avoid cutting or patching.
B. See Alterations article above for additional requirements.
C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.
D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
G. Restore work with new products in accordance with requirements of Contract Documents.
H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK - SEE SECTION 01 76 00 FOR ADDITIONAL REQUIREMENTS
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.09 DEMONSTRATION AND INSTRUCTION
   A. See Section 01 79 00 - Demonstration and Training.

3.10 ADJUSTING
   A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING
   A. See Section 01 74 23 - Final Cleaning

3.12 CLOSEOUT PROCEDURES
   A. See Section 01 77 00.
   B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
   C. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

END OF SECTION
SECTION 01 74 13 – CONSTRUCTION CLEANING

1. GENERAL

1.1 SECTION INCLUDES

A. Base bid:

1. General Contractor & Assigned Contractors Provide:

   a. Cleaning and disposal of waste materials, debris and rubbish during construction.

2. General Contractor Provide:

   a. Supervise and coordinate cleaning operations of all assigned contractors.

   b. Responsibility to keep the construction site clean. Contractor shall have the right to back charge any assigned contractor or subcontractor, if necessary.

1.2 RELATED WORK

A. Specified Elsewhere:

   1. Individual Specification Sections: Specific cleaning for product or work.

2. PRODUCTS

2.1 EQUIPMENT

A. Provide covered containers for deposit of waste materials, debris and rubbish.

3. EXECUTION

3.1 PROGRESS CLEANING

A. Contractor and Assigned Contractors shall:

   1. Maintain all construction areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition at all times.

   2. Daily, during the progress of this work, remove all rubbish, debris, surplus material and packaging materials from the areas of the work, the building and UIUC's property and shall dispose of same by EPA approved methods.

   3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

   4. After Contractor and/or Assigned Contractor has competed work associated with a back check of punch list items and prior to UIUC housing crews moving onto a
floor or floors for final cleaning, Contractor shall broom clean and vacuum all surfaces of all floors, remove all debris and remove protective coverings.

5. The Contractor shall ensure that cleaning requirements are adhered to.

6. The Contractor shall ensure that the floor has been returned to condition compliant with video tape (taped prior to construction) and that damages are addressed as per General Conditions and that the respective contractor responsible for the damage has been identified and agrees to perform the remedial work. Neither the Professional Services Consultant nor UIUC will adjudicate such matters.

NOTE: Each contractor shall obtain any Federal, State, and/or County "Dumping Permits" required.

END OF SECTION 01 74 13
PART I - GENERAL

1.01 REQUIREMENTS INCLUDE
A. Coordinating Contractor: Provide all final cleaning including for the Work of assigned Contractors.
   1. Contractor provide cleaning and disposal of waste materials, debris and rubbish during asbestos and lead abatement.
   2. At completion of all work remove all waste, debris, rubbish, tools, equipment, machinery and surplus materials. Clean all sight exposed surfaces; leave work clean and ready for occupancy.

1.02 RELATED REQUIREMENTS
A. Specified elsewhere:
B. 01 35 46 – Indoor Air Quality Procedures

1.03 SAFETY REQUIREMENTS
A. Comply with the requirements of Authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 EQUIPMENT
A. Abatement: Provide covered, poly-lined, and locked containers for deposit of hazardous waste, special waste, construction debris, and rubbish. Poly-lined and covered cart shall be used to transport waste through the building.

2.02 CLEANING 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.
B. Cleaning agents shall meet Green Seal GS-37 Standards.
C. Floor cleaners shall comply with the California Code of Regulations maximum allowable VOC content.
D. Disposable paper products, supplies and trash bags shall meet the minimum requirements of the US Environmental Protection Agency’s Comprehensive Procurement Guidelines.
E. If the Green Seal GS-37 Standard is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING
A. Maintain areas under Contractor's control free of waste materials, debris, and rubbish.
B. Periodically clean all areas both interior and exterior to provide suitable conditions for Owner occupied areas.

3.02 FINAL CLEANING
A. General: Provide final cleaning. Do not conflict with related Project Sections. Resolve with AE should any conflicts arise.
B. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
C. 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.
D. If final cleaning is delayed until final acceptance, revise subparagraph and associated subparagraphs below.
E. Complete the following cleaning operations before requesting inspection for certification of
Substantial Completion for entire Project or for a portion of Project:

1. 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.

2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign
deposits.

3. Remove tools, construction equipment, machinery, and surplus material from Project site.

4. Remove snow and ice to provide safe access to building.

5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of
stains, films, and similar foreign substances. Avoid disturbing natural weathering of
exterior surfaces. Restore reflective surfaces to their original condition.

6. Remove debris and surface dust from limited access spaces, including roofs, plenums,
shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

7. Sweep concrete floors broom clean in unoccupied spaces.

8. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if
visible soil or stains remain.
   a. Clean transparent materials, including mirrors and glass in doors and windows.
      Remove glazing compounds and other noticeable, vision-obscuring materials.
      Replace chipped or broken glass and other damaged transparent materials. Polish
      mirrors and glass, taking care not to scratch surfaces.
      1) Remove labels that are not permanent.
      2) Touch up and otherwise repair and restore marred, exposed finishes and
         surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or
         restored or that already show evidence of repair or restoration.
         (a) Do not paint over "UL" and similar labels, including mechanical and
electrical nameplates.

3) Remove grease, dust, dirt, stains, labels, fingerprints, protection and other
foreign materials from sight-exposed interior and exterior finished surfaces;
   polish surfaces so designated to specified finish.
   (a) In preparation for substantial completion or occupancy, conduct final
      inspection of sight-exposed interior and exterior surfaces, and of concealed
      spaces to ensure performance.

4) Contractor vacuum clean and mop all surfaces of pedestal floors and supports,
   including entire area beneath pedestal floors.

5) Ventilating Contractor replace air handling (conditioning) filters if units were
   operated during construction. Clean permanent air filters. Clean exposed
   surfaces of diffusers, registers, and grills.

6) Ventilating Contractor vacuum clean ducts, blowers and coils, when directed by
   AE.

7) Each contractor maintain finally cleaned areas until project, or designated
   portion thereof, is accepted by the Owner.

8) Wipe surfaces of mechanical and electrical equipment, elevator equipment, and
   similar equipment. Remove excess lubrication, paint and mortar droppings, and
   other foreign substances.

9) Replace parts subject to unusual operating conditions.

10) Clean ducts, blowers, and coils if units were operated without filters during
    construction.

11) Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
    Replace burned-out bulbs, and those noticeably dimmed by hours of use, and
    defective and noisy starters in fluorescent and mercury vapor fixtures to comply
    with requirements for new fixtures.

12) Leave Project clean and ready for occupancy.

F. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or
excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous
materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.03 DISPOSAL - ACM MATERIALS

A. Remove waste materials, debris, and rubbish from site periodically and dispose of in accord with applicable IEPA regulations.

B. All waste shall be removed from the work site immediately upon completion of work. The Waste Shipment Records (WSR) shall be delivered to the Asbestos Project Designer within ten (10) working days after completion of abatement work.

END OF SECTION
PART I - GENERAL

1.01 PROTECTION OF ALL INSTALLED CONSTRUCTION

A. Any Component / System that is damaged, including but not limited to accidents or misuse resulting in scratches, dents, abrasions etc., shall be repaired back to "like new condition", otherwise the same equipment shall be replaced with new equipment prior to "Final Acceptance" to the satisfaction of the Owner. This applies to all installed construction, including general, mechanical and electrical devices, equipment and systems, regardless of acceptance for use for and / or during Construction.

B. The Contractor shall only use permanent equipment as specified in the Contract Documents. Specific requests to use permanent equipment other than what is specified in the Contract Documents must first be approved by the Owner prior to such use. This includes the use of devices, equipment and systems, such as elevators or HVAC equipment, during any phase of construction prior to University "Final Acceptance."

C. During the construction process, each Contractor provide a written Plan outlining conformance with all Contract Sections and shall ensure that all installed devices, equipment and systems are not exposed to construction environments that are likely to hinder their proper operation/performance or shorten their useful life regardless of desire by Contractor for use prior to "Final Acceptance."

D. All equipment warranties shall be adjusted and / or extended so as to not impact the normal minimum expected warranty duration as expressed or implied within this project in accordance with the Base Bid requirements and without additional cost to the project or the University.

E. Protect all components containing fluid(s) from freezing. Ensure all related safeties and necessary controls are active and functioning. Verify with Owner prior to use. This will not constitute "final acceptance" of components or systems.

F. Under no circumstance shall any system in whole or part be allowed to operate beyond the design parameters of this project or the respective manufacturer's limits.

1.02 USE OF PERMANENT AIR HANDLING UNIT (AHU) AND DISTRIBUTION SYSTEMS FOR CONSTRUCTION PURPOSES

A. The use of permanently installed AHUs and associated distribution systems for temporary heating and cooling during construction shall only be permitted as specified in the Contract Documents. Specific requests to use permanently installed HVAC equipment other than what is specified in the Contract Documents must first be approved by the Owner prior to such use. Requests shall be considered only after a written plan for temporary use has been provided clarifying satisfactory implementation of the requirements of this Section. Requests do not constitute automatic approval for use.

B. At no additional cost to the Project or Owner, minimum basic requirements that shall be met if permanent equipment is permitted to be used include:
   1. Coordinate work with related Air Handling equipment, Duct and Duct Accessory sections.
   2. All work shall comply with the Commissioning requirements and the LEED requirements for the Project.
   3. All work on the AHUs shall be permanent, not temporary. This includes unit ductwork and insulation, hot water and chilled water pumps, piping and insulation, unit condensate drains if used for cooling, electrical components and controls.
   4. Fans and related system components shall not run in such a manner as to allow fans to be in surge or unstable operation nor run within 80% of Maximum RPM.
   5. Any meters, such as steam or chilled water, shall be operative, installed, calibrated and functioning prior to use. If necessary, a temporary meter shall be installed which meets the same reliability and accuracy requirements as the permanent meter specified in the Contract Documents.
   6. Controls shall ensure safe operation without risk to the equipment or building. Freeze stats, static pressure safety switches, control dampers, etc. shall be in operation and
successfully functionally tested. A means to send out an alarm in case of unit failure shall be in place.

7. Perform all specified and manufacturer’s start up procedures on all equipment being used, including VFDs. Provide verified results, Data, Reports, Checklists to the Owner’s Representative.

8. A written plan shall be implemented to monitor the systems and ensure adequate changing of filters. This plan shall include in writing the Contractor or Subcontractor who is responsible to monitor and maintain the systems in operation, ensure that the plan is adhered to and respond when there is a failure. It is recommended that this be the Ventilation Contractor.

9. Air distribution systems shall be aggressively protected from dust during the construction process to ensure that no contamination of the duct system occurs. If air handling equipment is operated during the construction process for any reason (e.g. to provide temporary heat) for any length of time, special provisions shall be made to provide adequate filtration to protect all air handling equipment, distribution and return ductwork from exposure to dust, with filters being changed on a regular and frequent basis. Compliance with all Project LEED requirements and pursuit of credits shall be maintained.

10. All return ductwork shall be disconnected from the respective supply AHU and capped to prevent contamination. Filters of sufficient ASHRAE spot efficiency shall be used at all AHU entrance(s) and normal filter sections in air handlers during construction use to prevent pass-through of construction dust 3 microns and larger in size even though the Project’s filter classification as of occupancy may be less. Again adhere to LEED requirements such as indicated for Flushout.

11. Where it is physically impossible to disconnect and mechanically cap respective return ductwork, minimum efficiency filters of a MERV 13 or higher rating shall be installed at all return ducting entrances (or openings to plenum areas) and normal filter sections in air handlers and maintained throughout the construction period to prevent pass-through of construction dust 3 microns and larger in size. Preauthorization from the Owner is required before proceeding.

12. Pipe flushing shall be completed and report validated with appropriate chemical testing.

13. All permanent filters shall be installed in the AHU and maintained throughout use. All filtration shall be at the expense of the Contractor.

14. Manufacturer warranty issues shall be resolved. Warranty extensions may be necessary.

15. Equipment used for temporary heating/cooling shall be in “like new” condition when turned over to the University.


17. The Contractor is responsible for meeting the more restrictive indoor air quality conditions during construction as stated in the Contract Documents or throughout the NADCA Standards and Procedures as referenced within the April 8, 2002 edition or newer “NADCA General Specifications for the Cleaning of Commercial Heating, Ventilating and Air Conditioning Systems”. Owner reserves the right to require the Contractor to perform cleaning using these NADCA approved cleaning equipment and procedures of all internal duct paths and AHU(s) just prior to final inspection / commissioning for consideration of final acceptance.

1.03 USE OF EXISTING ELEVATORS FOR CONSTRUCTION PURPOSES (NO ELEVATOR CONTRACTOR IS CONTRACTED FOR THE PROJECT)

A. The use of an existing elevator during construction shall be strictly prohibited. Any deviation from this policy shall only be permitted by means of an approved variance for the project.

1.04 FINISHES AND FURNISHINGS

A. Each Contractor shall ensure that all installed finishes and furnishings are not exposed to construction environments that are likely to mar their appearance or shorten their useful life. For example, carpet and other floor finish surfaces shall not be installed at a stage in the Project, which will result in them being subjected to excessive soiling, spotting, staining, scratching,
abrasion, or wetting. Contractor or sub-contractors shall not use any installed furniture item as a bench, ladder or support for work they may be completing in any University space. If such furnishings impede or block assigned work, contractor shall notify Owner for adjustment or removal of said furnishings.

PART 2 - PRODUCTS
2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION
3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
SECTION 01 77 00 - CLOSEOUT PROCEDURES AND REQUIREMENTS

PART I - GENERAL

1.01 SUMMARY

A. Administrative and procedural requirements for contract closeout including, but not limited to
   the following: (as part of Set of Manuals & Documents for Commissioning process)
   1. Inspection procedures including Pre-Functional Checklists and Pre-Substantial Checklists.
   2. Functional Testing Procedures (part of Commissioning process)
   3. Project record document submittal set(s)
   4. Operation and maintenance manual submittal set(s).
   5. Submittal set of warranties.
   6. Final cleaning (documentation as defined in Project Cleaning Section).

B. Closeout requirements for specific construction activities are included in the appropriate
   Sections in Divisions 1 through 48 and shall be coordinated with this Section.

1.02 RELATED SECTIONS

A. Section 01 74 23 – Final Cleaning
B. Section 01 78 23 – Operation and Maintenance Data
C. Section 01 78 39 – Project Record Documents
D. Section 01 74 00 - Warranties and Bonds
E. Section 01 79 00 – Demonstration and Training

1.03 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.
B. Exhibits: Pre-Substantial (Verification of) Completion Checklists:
   1. Exhibit 01 77 00-1, Architectural Requirements
   2. Exhibit 01 77 00-5, Cooling Requirements
   3. Exhibit 01 77 00-6, Ventilation Requirements
   4. Exhibit 01 77 00-7: Controls Requirements
   5. Exhibit 01 77 00-9, Electrical Distribution Requirements
   6. Exhibit 01 77 00-13, Routine Construction Inspection Report

1.04 INSPECTION PROCEDURES

A. Progress Inspections: In addition to AE observations, progress inspections will be conducted by
   an assigned University Facilities & Services Division Quality Assurance (Inspection and
   Commissioning) (FSQA) Team throughout the course of the construction Project. The objective
   of this inspection is to effectively see that construction is carried out in accordance with the
   approved plans and code requirements.

B. Substantial Completion and Final Acceptance Inspections: Additional inspections will also be
   performed by the AE and FSQA in conjunction with Substantial Completion and Final
   Acceptance.

1.05 SUBSTANTIAL COMPLETION

A. Definition: Substantial Completion is that condition which occurs when the Owner accepts the
   certification of the AE that construction is sufficiently complete in accordance with the Contract
   Documents so that the Project may be occupied for the use for which it is intended.

B. Contractor Notification: When Contractor considers work substantially complete, and after the
   building commissioning and training, submit written declaration to the AE that Work or
   designated portion thereof, is substantially complete. Include list of items to be completed or
   corrected.

C. Preliminary Procedures: Before requesting inspection for determining date of Substantial
   Completion, complete the following. List items below that are incomplete with request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit: Completed Commissioning Manual including but not limited to - Summary by specification # Record of Approved Submittals and Samples, Project Record Documents (including but not limited to As-Built Record Drawings, As-Built Record Specifications, Operating and Maintenance Manuals, Certification of No Asbestos Products Incorporated in Project, Completed Punch Lists, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
15. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
16. Prior to preliminary Substantial Completion and Inspection – Submit:
   a. Operating and Maintenance Data
   b. Keys and keying schedule
   c. Guarantees, Warranties and Bonds
   d. Completed pre-substantial completion checklists

D. Preliminary Inspection: AE will make a preliminary inspection within 7 business days after receipt of Contractor’s declaration.

E. Submit a written request for inspection for Substantial Completion. Upon receipt of request, Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. AE will prepare the Certificate of Substantial Completion A.I.A. Document G704 or similar, after inspection or will notify Contractor of items, either on Contractor’s list or additional items identified by AE, that must be completed or corrected before certificate will be issued.
   1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for final completion.

F. Upon determining that Work is substantially complete, AE will:
   1. Punch List: Prepare a punch list of items to be completed or corrected, as determined by the inspection.
   2. 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. Use CSI Form 14.1A.
a. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
b. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
c. Include the following information at the top of each page:
   1) Project name.
   2) Date.
   3) Name of AE and Construction Manager.
   4) Name of Contractor.
   5) Page number.
d. Submit list of incomplete items in the following format:
   1) PDF electronic file.
   2) Three paper copies of product schedule or list, unless otherwise indicated. AE, through Construction Manager, will return two copies.

3. Certificate: Prepare and process a certificate of substantial completion, containing:
   a. Date of substantial completion.
   b. Punchlist of items to be completed or corrected.
   c. The time within which punchlist items shall be completed or corrected.
   d. Date and time the Owner will take occupancy of Project or designated portion thereof.
   e. Responsibilities of Owner and Contractor for:
      1) Insurance.
      2) Utilities.
      3) Operation and maintenance of mechanical, electrical and other systems.
      4) Maintenance and cleaning.
      5) Security.
   f. Signatures of:
      1) AE.
      2) General Contractor.
      3) Owner.
      4) Prime Contractor.

G. Contractor is responsible for the following:
   1. Corrections: Complete all Work listed for completion or correction within designated time.
   2. Final Cleaning: Perform final cleaning.

H. Occupancy: Using Agency will occupy Project or designated portions thereof under provisions stated in the Certificate of Substantial Completion.

I. Complete All Work: At time of inspection, should substantial completion not be certified, Contractor shall complete the Work and resubmit declaration in accordance with item the requirements of this Section.

1.06 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and complete operations where required.
   2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
   3. Submit certified copy of the AE’s final inspection list of items to be completed or corrected, endorsed and dated by the AE. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the AE.
   4. Submit consent of surety to final payment.
   5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
7. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Final Inspection: Submit a written request for final inspection for acceptance. On receipt of request, AE and Construction Manager will either proceed with inspection with Contractor or/and as appropriate notify Contractor of unfulfilled requirements to ensure completion of all Contract requirements.

C. Closeout Documents: AE will prepare and process closeout documents when all Work is considered finally complete in accord with Contract Document requirements including all Deliverable Documentation.

D. AE 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.

E. Re-inspection Procedure:
1. The AE will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the AE.
2. Upon successful completion of re-inspection, the AE will prepare a certificate of final acceptance. If the Work is incomplete, the AE will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. When necessary, reinspection will be repeated.

1.07 WARRANTIES (COMMENCING OTHER THAN DATE OF SUBSTANTIAL COMPLETION)

A. Submittal Time: Submit written warranties on request of AE for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES" Project name, and name of Contractor.
4. 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 table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS
PART 3 - EXECUTION

END OF SECTION
NOTE: Upon receipt of affirmative response on all applicable items used above, FSQA will recommend acceptance of Substantial Completion certification.
NOTE: Upon receipt of affirmative response on all applicable items used above, FSQA will recommend acceptance of Substantial Completion certification.
**PROJECT NAME:** ______________________________________________________

**BUILDING #:** ______________________________________________________

**DATE:** __________________________________________________________________

### PRE-SUBSTANTIAL COMPLETION

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# FACILITIES AND SERVICES QUALITY ASSURANCE DIVISION

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<td>1.4 ☐ Functional Performance Testing Procedures</td>
<td>1.5 ☑ Pre substantial completion</td>
<td>1.6 ☑ Final acceptance</td>
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**LOC. #:**

**INSPECTOR:**

**INSPECTOR’S TRADE:**

**DATE OF INSPECTION:**

**TIME OF INSPECTION:**

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*IMMEDIATE CORRECTIVE ACTION REQUIRED*

**NOTE:** Upon receipt of affirmative response on all applicable items used above, FSQA will recommend acceptance of Substantial Completion certification.
SECTION 01 77 40 – WORK AREA CLEARANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Visual Inspection: required as a prerequisite of air testing, is set forth in Section 017423 Construction Cleaning.

C. Air Monitoring: performed by the University during abatement work. Daily air sampling shall be analyzed by Phase Contrast Microscopy (PCM) by the ASP. Clearance air sampling shall be analyzed by PCM by an accredited laboratory.

1.2 SUMMARY

A. Not in Contract Sum: This section describes work being performed by the University. This work is not in the Contract Sum.

B. This section sets forth required final air clearance sampling in the Work Area and describes testing procedures the University will use to measure these levels.

1.3 CONTRACTOR RELEASE CRITERIA

A. The asbestos abatement Work Area is cleared when the Work Area is visually clean and airborne asbestos structure and/or lead concentrations have been reduced to the level specified in this section.

B. The replacement Work Area is cleared when visual observations are conducted by the University following any the completion of containment dismantling and punch list items.

1.4 VISUAL INSPECTION

A. Work of this section will not begin until the visual inspection described in Section 017423 Construction Cleaning is complete. Contractor’s Supervisor must accompany the APM during the visual inspection.

1.5 AIR MONITORING

A. To determine if the elevated airborne asbestos structure concentration encountered during abatement operations has been reduced to the clearance level, the ASP will collect final air clearance samples and analyze. Contractor’s Supervisor must accompany the ASP during the final air clearance sampling.

1.6 ASBESTOS CLEARANCE SAMPLING

A. All final air clearance samples will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower electric motor) will be swept against all
walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be
continued for five (5) minutes per 1,000 sq. ft of floor space.
2. One (1) 20 in. diameter fan per 10,000 cu. ft of room volume will be mounted in a
central location at approximately 1 meter above floor, directed toward ceiling and
operated at low speed for the entire period of sample collection.
3. Air samples will be collected in areas subject to normal air circulation away from
room corners, obstructed locations, and sites near windows, doors of vents.
4. After air sampling pumps have been shut off, fans will be shut off.
5. Analysis shall be by Phase Contrast Microscopy (PCM). Analysis will be conducted
by an independent testing laboratory approved by the Project Designer. Air samples
shall be collected according to the Rules and Regulations of the Illinois Asbestos
Abatement Act, Section 855.470 and the Federal Register, 40 CFR, Part 763, dated
Oct. 30, 1987, appendix A to subpart E, Page 41858, paragraph B.
6. Clearance release criteria for analysis by PCM is less than 0.01 fibers/cc as required.
7. The University may request clearance samples be analyzed by Transmission
Electron Microscopy (TEM). The clearance release criteria for analysis by TEM is
less than 70 S/mm$^2$ average of five (5) samples.

1.7 LEAD CLEARANCE SAMPLING

A. If the University requests that lead clearance samples be collected, then samples will be
taken using as follows:

1. Determine horizontal surfaces to be sampled.
2. Use HUD wipe sampling technique.
3. Analysis will be conducted by an independent testing laboratory approved by the
Project Designer. Wipe samples shall be collected in accordance with HUD
clearance wipe sampling procedures.
4. Clearance release criteria is less than 40 µg/ft$^2$ (floors) and 200 µg/ft$^2$ (window sills &
troughs).

1.8 CLEARANCE GUARANTEE

A. In the event that this clearance air sampling analysis should exceed the clearance criteria
set forth, the Contractor shall be responsible for all associated costs for the re-cleaning,
lab analysis, APM and ASP fees, and transportation of the samples to the laboratory until
such time that the area clears at acceptable standards.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 77 40
PART I - GENERAL

1.01 SUMMARY

A. Operation and Maintenance Data shall be submitted in appropriately-sized binders, with dividers, and organized by each piece of equipment or system.

B. Operation and Maintenance Data include the following:
   1. Title Page.
   2. Spine Label.
   3. Table of Contents.
   4. Contact Information.
   5. Contents Specific to Type of Manual (Equipment and Systems, or Materials and Finishes).

C. Store Operation and Maintenance Data in the field office apart from documents used for construction. Do not use Closeout Submittal Data for construction purposes. Maintain Closeout Submittal Data in good order and in a clean, dry, legible condition. Make all Closeout Submittal Data available at all times for the Owner’s and AE's inspections.

D. Each Contractor is responsible for obtaining, recording, and maintaining Operation and Maintenance Data applicable to its own Work. The Coordinating Contractor is responsible for coordinating information, where information from more than one Contractor is to be integrated with information from other Contractors to form one Closeout Submittal.

1.02 RELATED SECTIONS

A. Section 01 33 23 – Shop Drawings, Product Data, and Samples
B. Section 01 78 39 – Project Record Documents

PART 2 PRODUCTS

2.01 MANUALS – GENERAL

A. Format and organization:
   1. Format:
      a. Binders: Heavy-duty, 3-ring, vinyl-covered binders, in thickness to match contents, sized to hold 8.5"x11" paper. Use multiple binders if contents are over 3" thick.
      b. Binder dividers: Heavy-paper dividers with plastic-covered tabs for each section.
      c. Drawings: If oversize drawings are necessary, fold drawings to same size as text pages and use as fold-outs. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes.
   2. Organization:
      a. Separate manuals by Specification Division. No manual should cover more than one Specification Division.
      b. Divide each Specification Division by Specification Section.
      c. Divide each Specification Section by piece of equipment (using equipment ID).

B. General requirements. Each manual shall contain:
   1. Cover and Title Page. Include the following:
      a. U of I Official Project Name.
      b. U of I Official Project Number.
      c. Words "Operation & Maintenance Manual".
      d. Specification section covered, including number and name.
      e. Name of Contractor.
      f. Date of submittal.
      g. Short list of contents.
   2. Spine Label. Include the following:
      a. U of I Official Project Name.
      b. Words "Operation & Maintenance Manual."
      c. Specification section covered, including number and name.
      d. Date of submittal.
3. **Table of Contents.** Include the following:
   a. List each item included in the manual, identified by product name and specification section.

4. **Contact Information.** Include the following:
   a. List each Contractor’s name, contact, address, phone, and e-mail for each item covered, including emergency contact information.

5. **Contents specific to Manual Type.** See next section.

**C. Manual Type: Equipment and Systems Manuals.** Include the following contents:

1. **Manufacturer’s Product Data for each major component.** Include the following:
   a. Significant design criteria.
   b. List of equipment components.
   c. Product name, model number, and serial number, if applicable. If Product Data sheets contain information about multiple products, mark each sheet to identify product incorporated into Work in such a way as to be reproducible with black and white copying.
   d. Manufacturer’s name.
   e. Equipment function description.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.
   i. Engineering data and tests.
   j. Wiring, piping and control diagrams. Include color-coding key where required.
   k. Troubleshooting guide. Preferably include chart with three columns (malfunction, probable cause, recommended action). Troubleshooting instructions shall be predicated upon a logical effect-to-cause philosophy and a rapid replacement procedure to minimize equipment downtime.
   l. License requirements.
   m. Manufacturer’s Installation Instructions for each major component. Include instructions that ship with the unit.

2. **Manufacturer’s Operational Instructions for each major component.** Include the following:
   a. Operating procedures, including sequence of operation for normal, seasonal, and special condition operations. Include start-up, break-in, and shut-down procedures. Refer to controls and indicators by nomenclature consistent with that used on panels and in control diagrams.
   b. Operating instructions that ship with the unit.
   c. Checklists.
   d. Operating logs, if recommended.
   e. Precautions against improper use.

3. **Supplemental Shop Drawings for entire equipment or system.** Coordinate with information in Record Contract Drawings to ensure correct illustration of completed installation. Illustrate the following:
   a. The relationship of equipment components and system components to each other.
   b. Control sequences.
   c. Flow diagrams.
   d. If control drawings, include full points list, set point schedules, and set points after calibrations performed by contractor (not commissioning).

4. **Manufacturer’s Preventive Maintenance Instructions for each major component.** Include the following:
   a. Maintenance procedures, including test and inspection instructions, disassembly instructions, cleaning, minor repairs, and adjusting instructions that detail essential maintenance procedures. Include test points and values, and sensor calibration requirements and methods.
b. Maintenance and service schedules, including service and lubrication requirements,
   list of lubricants for equipment, cleaning, and separate schedules for preventive and
   routine maintenance and service with standard time allotment.

c. Spare parts documentation, including spare parts list, parts diagrams, complete
   nomenclature and number of parts, replacement and repair parts, parts identified and
   cross-referenced to maintenance documentation, and local sources of maintenance
   materials and related services.

d. Maintenance service contracts, including copy of service agreement and service
   agent name and contact information.

e. Exploded equipment views.

f. Precautions against improper maintenance.

5. Warranties and Bonds. Include the following:
   a. Warranty and/or bond.
   b. List of circumstances and conditions that would affect validity of warranty or bond.

6. Functional Performance Tests. Include the following:
   a. Start-up record.
   b. Copies of required tests, when required in Divisions 2 through 48 or when otherwise
      applicable (not including Test & Balance Reports – see 01 33 23), including
      submitting additional copies directly to governing authorities.

7. Safety Precautions. Include the following:
   a. List of precautions to be following before, during, and after operation, maintenance,
      or emergencies.
   b. Provide equipment- and/or system-specific Lockout/Tagout procedures for the
      isolation of hazardous energy and materials including but not limited to electrical,
      hydraulic, chemical, mechanical, pneumatic, thermal, gravitational, potential, and
      hazardous materials. Include the following:
      1) Equipment ID(s) and description(s)
      2) Location: building name, building number, location in building
      3) Steps for each type of energy source required for isolation:
         (a) Equipment ID
         (b) Lockout location (description and photo or diagram)
         (c) Energy source
         (d) Lockout device(s)
         (e) Lockout method
         (f) Verification

8. Emergency Procedures. Include the following:
   a. Emergency response instructions, organized by type of emergency, including
      equipment trouble indications and specific response procedure.
   b. Operating instructions for partial equipment failure conditions.

D. Manual Type: Materials and Finishes. Include the following contents:

1. Manufacturer’s Product Data. Include the following:
   a. Product name and model number. If Product Data sheets contain information about
      multiple products, mark each sheet to identify product incorporated into Work in such
      a way as to be reproducible with black & white copying.
   b. Color, pattern, size and texture.
   c. Material and chemical composition.
   d. Reordering information for specially manufactured products.

2. Manufacturer’s Maintenance Procedures. Include the following:
   a. Inspection procedures.
   b. Schedule for maintenance.
   c. Types of cleaning agents.
   d. Methods of cleaning.
   e. Schedule for cleaning.

3. Manufacturer’s recommended Repair Materials and Sources. Include the following:
a. List of repair materials.
b. List of local sources of materials and related services.
c. Repair instructions.

4. Warranties and Bonds. Include the following:
a. Warranty and/or bond.
b. List of circumstances and conditions that would affect validity of warranty or bond.

PART 3 EXECUTION

3.01 RECORDING

A. During construction, maintain a set of Operation and Maintenance Data specifically for the purpose of creating Close-out Submittals, separate from the set used for construction.
B. Maintain Operation and Maintenance Data in good order and in a clean, dry, legible condition.
C. Mark Operation and Maintenance Data to indicate actual work details.
D. Mark important additional information that was either shown schematically or omitted from Contract Documents.
E. Mark Operation and Maintenance Data completely and accurately.
F. Mark Operation and Maintenance Data in such a way as to be reproducible in black and white copying.
G. Make all Operation and Maintenance Data available at all times for the Owner's and AE's inspections.

3.02 RESPONSIBILITY FOR MARKUP

A. The individual or entity responsible for the Work involving the equipment, system, or product is responsible for maintaining Operation and Maintenance Data Closeout Submittals.
   1. Record changes and modifications as they occur – do not wait until the end of the Project.
   2. Record and check the markup prior to enclosing concealed installations.

3.03 SUBMISSION AND DISTRIBUTION

A. After completing Work, prepare Operation and Maintenance Data Closeout Submittals for submission.
   1. Each Contractor is responsible for submitting Operation and Maintenance Data Closeout Submittals to the Coordinating Contractor.
   2. Each Contractor shall submit all Operation and Maintenance Manuals related to each Contractor’s particular Work, whether or not changes and additional information were recorded.
   3. For equipment that requires commissioning, Coordinating Contractor shall submit two (2) draft copies of the Operation and Maintenance Manual to the AE for review by the AE and Contracted Commissioning Agent within sixty (60) calendar days after review of equipment shop drawings. Copies will be returned to the Coordinating Contractor within thirty (30) days after receipt by the AE and Contracted Commissioning Agent, along with review comments. Manuals must be submitted no later than thirty (30) days prior to final requirements in paragraph 4.
   4. Prior to Substantial Completion, the Coordinating Contractor shall submit to the AE three (3) copies of each Operation and Maintenance Manual.
   5. Transmit each submittal by use of a transmittal form.

END OF SECTION
PART I - GENERAL

1.01 DEFINITIONS
A. Record Documents – As-built Contract Drawings and As-built Specifications, completed by the Contractor.

B. As-built Contract Drawings or Contract Specifications – Drawings or specification section of the Project Manual marked-up (a.k.a. "red-lined") by Contractors to indicate work as completed that deviates from work as designed, and changes from Addendum, Change Orders, Requests for Information (RFIs), Architect’s Supplemental Instructions (ASIs), or Requests For Proposals (RFPs).

C. Record Contract Drawings or Contract Specifications – Drawings or specification section of the Project Manual showing work as completed, compiled (incorporating all Contractor As-built Drawings) by the AE.

1.02 SUMMARY
A. Record Documents required include the following:
   1. As-built Contract Drawings.
   2. As-built Specifications.

B. Store Record Documents in the field office apart from documents used for construction. Do not use Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition. Make all documents and samples available at all times for the Owner’s and AE’s inspections.

C. Each Contractor is responsible for obtaining, recording, and maintaining as-built information for its own Work. The Coordinating Contractor is responsible for coordinating information, where information from more than one Contractor is to be integrated with information from other Contractors to form one combined record.

D. Asbestos Contractor and Supervisor:
   1. At project site maintain one record copy of:
      a. All documentation required by IDPH Rules and Regulations.
      b. All submittals as indicated in Section 02 82 13.
      c. Contract drawings.
      e. Interpretations and supplemental conditions.
      f. Addenda.
      g. Reviewed, approved shop drawings and product data.
      h. Other modifications to contract.
      i. All schedules.
      j. Correspondence file.
      k. Applicable OSHA & EPA Rules and Regulations.
      l. Applicable IDPH Rules and Regulations.
   2. Store documents in temporary field office, apart from documents used for field construction.
   3. File documents in format in accord with Project Manual Table of Contents.
   5. Do not store record documents for field construction purposes.
   6. Make documents available at all times for inspection by Owner, Asbestos Project Designer, APM/ASP, or any regulatory agency.

1.03 RELATED SECTIONS
A. Section 01 33 23 – Shop Drawings, Product Data, and Samples
B. Section 01 56 00 - Barriers and Enclosures.
C. Section 01 78 23 – Operation and Maintenance Data
D. Section 01 78 39 - Project Record Documents.
PART 2 PRODUCTS

2.01 AS-BUILT CONTRACT DRAWINGS

A. Mark As-built Contract Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:
   1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   2. Locations of concealed internal utilities and appurtenances.
   3. Actual equipment locations.
   4. Revisions to routing of piping and conduits.
   5. Duct size and routing.
   6. Depths of foundations below the first floor.
   7. Revisions to electrical circuitry.
   8. Dimensional changes to the Drawings.
  10. Details not on original Contract Drawings
  11. Changes made by Addendum, Change Orders, Requests for Information (RFIs), Architect’s Supplemental Instructions (ASIs), or Requests For Proposals (RFPs).

B. Asbestos As-Built Record Documents (Recording):
   2. Label each document “PROJECT RECORD DOCUMENTS” in 2” high printed letters.
   4. Do not permanently conceal any work until specified information has been recorded.
   5. Contract drawings: Legibly mark to record actual construction:
      a. Field changes of dimension and detail.
      b. Changes made by change order.
      c. Details not on original contract drawings.
   6. Specifications and addenda: Legibly mark up each section to record:
      a. Manufacturer, trade names, catalog numbers, and supplier of each product and item of equipment actually installed.
      b. Changes made by change order or field order.
      c. Other matters not originally specified.
   7. Shop drawings: Maintain as record documents; legibly annotated drawings to record changes made after review.

2.02 AS-BUILT SPECIFICATIONS

A. Mark As-built Specifications to show Addendum, Change Orders, Requests for Information (RFIs), Architect’s Supplemental Instructions (ASIs), or Requests For Proposals (RFPs).

PART 3 EXECUTION

3.01 RECORDING

A. During construction, maintain a set of As-built Documents specifically for the purpose of creating As-built documents, separate from the set used for construction.
B. Maintain As-built Documents in good order and in a clean, dry, legible condition.
C. Mark As-built Documents to indicate actual work done that deviates from the Contract Drawings.
D. Mark important additional information that was either shown schematically or omitted from Contract Documents.
E. Mark As-built Documents completely and accurately.
F. Mark As-built Documents with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location. All marks shall be photo-reproducible.
G. Reference any changes to the Contract, including but not limited to Addenda, Change Orders, Change Directives, Supplemental Instructions, and other issued modifications. Use specific document numbers.
H. Make all documents and samples available at all times for the Owner’s and AE’s inspections.

3.02 RESPONSIBILITY FOR Markup
A. The individual or entity who obtained as-built data, whether the individual or entity is the installer, contractor, subcontractor, or similar entity, shall record the markup.
   1. Record changes and modifications as they occur – do not wait until the end of the Project.
   2. Record and check the markup prior to enclosing concealed installations.

3.03 SUBMISSION AND DISTRIBUTION
A. After completing the preparation of As-built Drawings, prepare the drawings for distribution.
   1. Each Contractor is responsible for submitting original As-built Drawings to the Coordinating Contractor.
   2. SITE UTILITIES: Within ten (10) working days of completion of site utilities, the Coordinating Contractor shall submit to the AE one (1) CD with scanned color copies of each As-built Contract Drawing that shows site utility improvements, saved one sheet per file.
   3. Prior to Substantial Completion, the Coordinating Contractor shall submit to the AE one (1) set of each As-built Contract Drawing and Specification Section in final form and one (1) CD with scanned color copies of each sheet, saved one sheet per file.
   4. Submit all Drawings related to each Contractor’s particular Work, whether or not changes and additional information were recorded. Organize the copies into manageable sets with paper cover sheets. Cover sheets will include U of I Project Name, U of I Project Number, Work covered, and date.
   5. Transmit each submittal by use of a transmittal form.
B. Asbestos Contractor:
   1. At completion of project, Asbestos Contractor shall deliver record documents to Asbestos Project Designer within one week of final air clearances (See Sections 01 33 23 and 02 80 00.).
   2. At the completion of the project, Asbestos Contractor shall deliver record documents to the Asbestos Project Designer within one week of completion of replacement project (See Section 01 33 23) of all products used and manufacturer’s information including warranties.
   3. Accompany submittal with transmittal letter, in duplicate, containing:
      a. Date.
      b. Project title and number.
      c. Asbestos Contractor’s name and address.
      d. Title and number of each record document.
      e. Certification that each document submitted is complete and accurate.
      f. Signature of Asbestos Contractor, or his authorized representative.

END OF SECTION
PART I - GENERAL

1.01 RELATED SECTIONS
   A. Section 01 33 23 – Shop Drawings, Product Data, and Samples
   B. Section 01 77 00 – Closeout Procedures
   C. Section 01 78 39 – Project Record Documents

1.02 SCOPE OF TRAINING
   A. Training must include both classroom and on-the-job (hands-on) instruction by qualified manufacturer's representatives, vendors, installation/service technicians, and operation personnel having the necessary knowledge, experience, and teaching skills.
      1. Scheduling must be coordinated and confirmed with the Owner prior to Substantial completion.
      2. In addition to respective Sections where specified, a minimum of one (1) full day of onsite classroom style instruction is required.
      3. In addition to respective Sections where specified, a minimum of one (1) full day of on-the-job (hands-on) instruction is required.
   B. The training shall provide comprehensive instruction on the operation and maintenance of building components, equipment, controls, and systems including procedures for routine startup, shutdown, normal operation, abnormal operation, preventive maintenance, troubleshooting, and corrective maintenance.
   C. All training sessions will be recorded by the Contractor if required by the Contract Documents and seven (7) copies [one copy for each O&M manual] of the recording are to be provided to the Owner at the conclusion of the training session. Format for submitted video recording (DVD) shall be determined by the Owner.
   D. Follow-up or post-occupancy training, where specified, shall be planned, scheduled and conducted per the requirements of this specification. This training will focus on seasonal issues that could not be addressed during the initial training and on addressing operational and maintenance issues identified by the Owner since turnover.

1.03 COORDINATION & SCHEDULING
   A. Training shall not begin until the following items have been completed:
      1. Building systems and equipment are complete and operational.
      2. The Owner has received and approved the final submittal copies of the Operation and Maintenance Manuals
      3. The Contractor's proposed training plan and schedule have been approved by the Owner.
   B. The Contractor shall work closely with the Owner’s personnel and the CxA in the development and implementation of the training program. This may include preliminary meetings to map out the direction the training will take and development, with Owner approval, of the written training materials.
   C. The minimum specific hours of training time provided for each category of major equipment and systems shall be in accordance with the specification sections pertaining to this equipment or systems. Where training session duration (hours) are not provided in the specifications, Contractors shall coordinate with the Owner for developing the hours of instruction and scope of material to be covered.
   D. The Owner retains the option of redistributing training time, subject to the total time specified. This may include repetition of selected training sessions or provision for follow-up training sessions after occupancy.
   E. Training must be presented on an 8-hour per day, 5-day per week schedule, with all reading assignments and review to be within this period.
   F. Mutually agreeable dates for training shall be arranged with Owner, but the training shall be completed before occupancy or final acceptance.
Specific schedules for all training sessions must be coordinated in advance with the Owner.

1.04 TRAINING PROGRAM AND MATERIALS

A. The Contractor will submit a written training program outlining the proposed scope of training, training materials and instruction schedule for review and approval by the Owner approximately 30 days before the scheduled completion of the work for which training is to occur.

B. The Commissioning Team will provide sample training session guidelines and agendas for use by the Contractors in developing their training programs where applicable.

C. Copies of training materials furnished by the Contractor as part of their training program shall become the property of the Owner. This includes but is not limited to:
   1. All lesson plans, teachers’ guides or training aids used to instruct the students. One complete set shall be given to the Owner.
   2. All written materials e.g. workbooks, manufacturers’ instructions, brochures, student tests, charts or other printed or photographed visual aids. Three (3) sets with one complete reproducible master shall be given to the Owner.
   3. All audio visual materials (e.g. digital recordings). Three sets shall be given to the Owner.

1.05 INSTRUCTOR QUALIFICATIONS

A. Credentials of training instructors are subject to review and approval by the Owner.

B. Instructors must have knowledge and experience with the equipment on which they are providing training.

C. Instructors must be familiar with the organization and content of Operation and Maintenance Manuals for the equipment on which they are providing training.

D. Instructors for controls must be knowledgeable and familiar with the specific controls equipment, project applications, and specific sequences of operation for this project.

1.06 CLASSROOM TRAINING FACILITIES

A. Locations for classroom training sessions shall be coordinated and scheduled with the Owner. All training shall be conducted on-site.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.01 NOT APPLICABLE TO THIS SECTION

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Selective demolition of building elements for alteration purposes. Excluding removal of hazardous materials and toxic substances.

1.02 RELATED REQUIREMENTS
   A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
   B. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Site Plan: Showing:
      1. Areas for Temporary Construction.
   C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
      1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
      2. Identify demolition firm and submit qualifications.
      3. Include a summary of safety procedures.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS
   A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
      1. Obtain required permits.
      2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
      3. Provide, erect, and maintain temporary barriers and security devices.
      4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
      5. Do not close or obstruct roadways or sidewalks without permit.
      6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   B. Do not begin removal until receipt of notification to proceed from Owner.
   C. Protect existing structures and other elements that are not to be removed.
      1. Provide bracing and shoring.
      2. Prevent movement or settlement of adjacent structures.
      3. Stop work immediately if adjacent structures appear to be in danger.

3.02 EXISTING UTILITIES
   A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
   B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

E. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

F. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

C. Services (Including but not limited to HVAC and Electrical): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL
A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION
SECTION 02 80 00 – ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid: General /Asbestos Contractor provide:

1. Complete removal and disposal of asbestos-containing materials (ACM) to include the vapor barrier located about 12 inches below the concrete under the ice along with the adjacent concrete as shown on drawings. This containment includes both the main ice arena and the lower level tunnel.

B. By Others:

1. Owner:

   a. Coordinate all work activities with building occupants.
   b. Execute all contracts and change orders.
   c. Shut down of all existing power and lighting (including emergency) to the regulated area to include any HVAC.
   d. Prepare payments for all work.
   e. Authorize the work to be conducted.
   f. Remove all non-contaminated equipment and supplies from the areas of abatement prior to the commencement of any abatement activities.
   g. Perform its responsibilities in accord with referenced parts of this Specification.
   h. Provide authorization of any temporary utility connections.
   i. Move all previously cleaned equipment and supplies back into accepted cleaned areas.

2. Architect

   a. Work with Owner to coordinate all work activities.
   b. Review and approve submittals.
   c. Review and provide to Owner any changes to Work.

3. Asbestos Consultant:

   a. Work with Owner and Architect to coordinate the abatement activities.
   b. Perform Duties of Asbestos Project Designer and APM/ASP.

4. General Contractor

   a. Provide for qualified personnel or subcontractor to complete work specified in this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Specified elsewhere:
1. **01 35 00 - Special Procedures**
2. **01 35 27 - Worker Protection.**
3. **01 35 28 - Respiratory Protection.**
4. **01 35 43 - Environmental Requirements Site Enforcement.**
5. **01 35 44 - Decontamination Units.**
6. **01 35 46 - Indoor Air Quality Procedures.**
7. **01 41 00 - Regulatory Requirements.**
8. **01 42 00 - Definitions ACM, Lead & Hazardous Waste.**
9. **01 51 30 - Temporary Pressure Differential and Air Circulation Systems.**
10. **02 80 00 - Asbestos Abatement.**
11. **02 82 12 - Disposal of Asbestos Waste.**
12. **02 90 00 - Lead Removal.**

1.3 REGULATORY REQUIREMENTS

**A.** IDPH Rules and Regulations.

**B.** Following regulations:

4. All applicable OSHA and EPA regulations.

**C.** Federal Requirements:

2. OSHA - Occupational Safety and Health Administration.
3. EPA – Environmental Protection Agency.
4. DOT - Department of Transportation.

1.4 EXISTING CONDITIONS

**A.** Owner will remove all equipment, supplies, and furniture in abatement areas.

**B.** The building is in the process of being renovated and renovation activities will continue throughout the abatement activities in other areas in the building.

**C.** The building will be occupied during the abatement and Asbestos Contractor shall minimize any disturbance to building occupants.
1.5 QUALITY CONTROL

A. Air Monitoring:

1. Air monitoring will be conducted by an ASP to determine the current levels of asbestos fibers during abatement activities to include background and daily samples.
2. Asbestos Contractor shall conduct personal air sampling as required by OSHA for the entire duration of the project.
   a. Provide air monitoring of own personnel and provide a copy of all results to the APM within twenty-four (24) hours.
   b. The minimum number of samples taken daily will include, one excursion limit and one 8 hour time-weighted average for each classification of work (ie; prep work, abatement, and cleaning).

B. Asbestos Contractor shall:

1. Be confined to the regulated work areas as much as possible. The Owner's activities must be allowed to continue as normal and shall be minimally inconvenienced to the extent possible.
2. Provide protection for the building and occupants in accord with the IDPH Rules and Regulations for Asbestos Abatement and EPA NESHAPs.
3. Pre-cleaning the work area.
5. The Supervisor will perform regular and routine inspections both inside and outside the work area throughout the Project to include work area inspections at least twice per day as required by OSHA and IDPH regulations.
6. The Supervisor will perform a thorough inspection at the completion of the final cleaning in each regulated area and prior to his request for the APM to perform the final visual inspection.
7. The APM may request the Supervisor to accompany him or perform independent inspections within or outside the work area at any time. No workers will be permitted to act on the behalf of the Supervisor. The Supervisor shall also accompany the ASP during the final air clearances.
8. Isolation of the work site to a confined area. All work barriers and warning signs are to be in place prior to the abatement.
9. Provide GFCI protected electrical cords and outlets for the APM/ASP’s use.
10. Emergency planning shall be developed prior to abatement initiation and agreed to by Asbestos Contractor, Owner, and APM/ASP.
   a. Emergency procedures shall be in written form and prominently posted in the clean room of the worker decontamination unit. Everyone prior to entering the work area must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures.
   b. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities, work
schedule, and layout of the work area, particularly any barriers that may affect response capabilities.

c. Emergency planning shall include considerations of weather, fire, explosion, toxic atmospheres, electrical hazards, slips, trips, falls, confined spaces, and heat-related injuries. Written procedures shall be developed and employee training in procedures shall be provided.

d. Employees shall be trained in evacuation procedures in the event of workplace emergencies for both non-life-threatening and life-threatening situations.

e. Emergency planning shall include provisions for respirator failure and other PPE failures.

1.6 SUBMITTALS

A. Provide a schedule for the work detailing the areas or rooms that will be abated. Schedule work through the Owner and General Contractor to allow the Owner’s normal operations to be minimally inconvenienced. All schedules shall be approved by the Owner, A/E and Asbestos Consultant. Work shall not commence without their approval.

1. Coordinate all work with the Owner and allow time for Owner to re-locate personnel and furniture/items.

B. Asbestos Contractor’s Supervisor and Workers shall have both asbestos and lead training and IDPH licensing. Contractor shall also have IDPH lead licensing.

C. Asbestos Contractor shall make all submittals to the Asbestos Project Designer at least ten (10) working days prior to commencement of work.

1. NESHAP Notification along with $150 filing fee to IEPA along with proper/official documentation or postmark on the date of filing.

   a. All revisions to the NESHAP notification shall be submitted to IEPA via hard copy/mail with postmark and a copy submitted to the Asbestos Project Designer.

3. Notification to emergency personnel regarding the dates and location within the building of the abatement to include, but not limited to, the fire and police departments.
4. Project Directory listing emergency phone numbers.
5. Photocopy of insurance.
6. Photocopy of IDPH licenses for company, supervisor, and workers. Submit documented evidence that each person, including the Contractor’s supervisor, performing asbestos work holds a valid IDPH License and accreditation certificate in accord with the IDPH Rules and Regulations for Asbestos Abatement, Parts 855.100 and 855.110.

   b. The original IDPH License or hard card must be on-site at all times for every worker and supervisor or they will not be allowed on-site.

7. Photocopy of current training certification for all supervisors and workers.
a. All supervisors and workers must have a copy of their current training certification on-site at all times or they will not be allowed on-site.

8. Photocopy of medical approval to wear respirators and personal protective equipment.
   a. All supervisors and workers must have a copy of their medical approval to wear a respirator and work with asbestos on-site at all times or they will not be allowed on-site.

9. Negative exposure assessment (NEA). Please provide documentation that personnel in the NEA have similar training and experience as the personnel on this project and all requirements per OSHA.
10. Photocopy of respirator fit testing.
   a. All supervisors and workers must have a copy of their fit testing on-site at all times or they will not be allowed on-site.

11. Landfill permit and arrangements for waste disposal.
12. Use of rental equipment:
   a. If to be used: Copy of notification to the rental company to inform them of the nature of the use of the equipment.
   b. If not to be used: Letter stating none will be used.

13. List of equipment to be used (including all NIOSH approved equipment).
14. Safety Data Sheets for all chemicals to be used.

D. Asbestos Contractor shall submit the NESHAP notification along with the $150 filing fee and submit to IEPA. Complete the information required in all sections of the State of Illinois Asbestos Abatement/Demolition/Renovation Uniform Notification Form. Ensure that this revised notification is postmarked or hand delivered to IEPA prior to the start of any construction. Send the Asbestos Project Designer a facsimile of this Notification.

NOTE: Facsimiles will not be accepted by the IEPA.

IEPA - Illinois Environmental Protection Agency:
Asbestos Unit- Division of Air Pollution
P.O. Box 19276
Springfield, IL 62794-9276
217/785-1743

2. Submit a copy of the State of Illinois EPA notification form along with documentation of postmark & filing fee to the Asbestos Project Designer at least ten (10) working days prior to the start of abatement.

1.7 SEQUENCING / SCHEDULING

A. The Asbestos Contractor is required to complete all work through Substantial Completion/Final Acceptance, and in accord with the contract.
B. Asbestos Contractor to coordinate work with the Owner and allow time for the Owner to re-locate personnel and furniture/items.

C. Work shall be performed as specified herein, indicated on drawings.

D. Asbestos Contractor shall coordinate schedule with other contractors, APM/ASP, and Owner. Asbestos abatement shall commence only after approved by the Owner, A/E and Asbestos Consultant. Work shall not commence without their approval.

1.8 TEMPORARY UTILITIES
A. Asbestos Contractor:
   1. Provide hygiene facilities, restrooms, and drinking water for own forces.
   2. Provide and maintain all electrical through GFCI protection as required by OSHA.

1.9 TEMPORARY ENCLOSURES AND BARRIERS
A. Asbestos Contractor shall provide and maintain suitable barriers with signage to prevent unauthorized entry and to protect the work.

B. Asbestos Contractor shall provide temporary enclosures to separate work areas from existing building and from areas occupied by Owner.

C. Temporary enclosure shall consist of:
   1. Install a rigid enclosure interior of the building using plywood and 2 x 4 wood studs. Provide adequate supports to hold the barrier in place for the entire duration of abatement and replacement.
   2. Place two (2) layers of six (6) mil poly sealing all edges and penetrations.
   4. Install barriers of a neat and uniform appearance, structurally adequate for purposes, and according to all applicable rules and regulations.
   5. Maintain barriers during entire construction period.
   6. Do no block any fire protection systems.

1.10 WORKER PROTECTION.
A. Asbestos Contractor shall provide worker protection as required by the most stringent OSHA and/or EPA regulations applicable to the work.

B. All workers are to be accredited as Abatement Workers as required by the AHERA regulation 40 CFR 763 Appendix C to Subpart E, April 30, 2987.

C. All workers are to be trained and licensed as required by the regulations.

D. Train, in accordance with 29 CFR 1926, all workers in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and areas protective measures.

E. Provide medical examinations for all workers who will enter the Work Area for any reason. Examinations shall as a minimum meet OSHA requirements as set forth in 29
CFR 1926. In addition, provide an evaluation of the individual’s ability to work in the environments capable of producing heat stress in the worker.

F. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be work by all workers including the Owner’s representative, APM/ASP, Asbestos Project Designer, and or anyone authorized to enter the work area. Provide a sufficient number for all required changes, for all workers in the work area. During waste disposal to the dumpster, coveralls shall be navy in color.

G. Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots red with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with asbestos-containing material. Dispose of boots as asbestos-contaminated waste at the end of the work.

H. Eye Protection: Provide eye protective (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.

I. Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.

J. Respirators: Provide the worker with a respirator and protective clothing based on the negative exposure assessment.

1. For this project a minimum of half-face respiratory protection will be allowed as long as the contractor can document by airborne asbestos fiber count data (negative exposure assessment) that this respirator is appropriate based on the hazard. If the Asbestos Contractor cannot provide this documentation, then the highest level of respiratory protection shall be used such as a PAPR.

2. Negative pressure half or full face respirators- Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters frequently as needed during the work day. Store respirators and filters at the job site as required by OSHA and protect from asbestos and weather elements.

K. Respirators, respirator cartridges, disposable coveralls, head covers, and footwear covers shall be provided by the Asbestos Contractor for the Owner, Owner’s Representative, Project Administrator, APM/ASP, Project Designer, and other authorized representatives who may inspect the job site.

1.11 WARRANTY. Warrant all work in accord with General Conditions for a time period of one year.

PART 2 - PRODUCTS

2.1 ABATEMENT EQUIPMENT: Use only materials and equipment complying with the Rules and Regulations for Asbestos Abatement and as specified herein.
A. Amended water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. For floor covering removal a substitute of a detergent solution (sixteen (16) ounces of liquid dish washing detergent to one gallon of warm water) may be used.

B. A sufficient supply of hand tools (e.g., scrapers, plastic shovels, etc.) and rubber dustpans/squeegees shall be provided as needed.

C. Sprayers with pumps capable of providing 500 pounds per square inch (psi) at the nozzle tip at a flow rate of 2 gallons per minute for spraying amended water.

D. Metal hand scrapers for removing tiles shall be sufficiently sharpened to minimize breakage.

E. A sufficient supply of HEPA filtered vacuum systems shall be available.

F. A sufficient supply of HEPA filters and pre-filters for the negative air machines shall be available.

G. Tri-sodium phosphate solution or similar for cleaning purposes.

2.2 ACCEPTABLE MANUFACTURERS/PRODUCTS

A. Wetting agent.

1. Certified Technologies Certane 2075
2. Eppert Oil Co. Speedi-Wet
3. Foster Products Corp 32-90

B. Combination wetting agent - encapsulant.

1. Certified Technologies Certane 707
2. Eppert Oil Co. Fiber-Seal
3. Foster Products Corp 32-60

C. Mastic Remover (Note - mastic removers must have a flash point greater than 200°F, a lower explosive limit greater than 5%, and low or no odor. Contractor shall be responsible for the elimination of any odor that may remain from the mastic remover or other chemicals used by the Contractor.)

1. Abatement Technologies Citrus 200 Plus
2. Certified Technologies Certane 77B
3. Eppert Oil Co. 200 or A
4. Sentinel Chemical Co. 7200
5. Soy mastic remover products

D. Polyethylene Sheeting:

1. Clear, 0.006 inches (6 mil) thick.
2. Black, 0.006 inches (6 mil) thick.
3. Opaque, 0.006 inches (6 mil) thick.

E. Safety Data Sheets:

1. Contractor shall submit to the Asbestos Project Designer at least ten (10) days prior to the commencement of the project, current Safety data Sheets on all products used in the performance of this contract. SDS shall be approved by the Owner.

PART 3 - EXECUTION

3.1 PREPARATION

A. The Air Sampling Professional will perform air quality tests (pre-abatement or background sampling) prior to commencement of abatement activities. Coordinate and schedule with APM/ASP in conducting the air sampling.

1. Cease work and change work methods when advised that air quality samples exceed OSHA limits.
2. Apply wetting agent and encapsulate removing all designated material in a careful manner to minimize breakage.
3. Remove door frame caulking throughout to include scraping off brick and mortar.

B. EXISTING BUILDING PROTECTION:

1. Protect existing items not indicated to be removed.
2. Protect ground cover from damage.
3. Protect building finishes and return to original condition.

C. Perform all preparation work in accordance with the all applicable regulations that include NESHAPS and IDPH Rules and Regulations as follows:

1. Work Area Preparation - 855.400.
2. Separation Barriers - 855.430.
3. Commencement of Work - 855.450.

D. WORK AREA PREPARATION

1. Construct separation barriers to isolate the abatement area and restrict access per IDPH 855.430. The work area will be restricted to building occupants during the abatement activities. Separation barriers shall be plywood sheeting supported by 2 in x 4 in wood framing with two layers of six (6) mil poly on the abatement side. Separation barriers shall be placed at all entrances to the work area.
2. Post OSHA asbestos warning sign at all entrances to the work area.
3. Coordinate with the building owner the shut down of all electrical power and lighting and provide temporary electrical power to the contained areas which are ground fault protected (G.F.C.I.). A licensed electrical will make the temporary
4. Coordinate with the Owner the shut down/isolation of HVAC systems which service and/or are located within the work area. Cover the HVAC ducts and openings with two layers of six (6) mil poly. Seal any system components that pass through the work area with two layers of six (6) mil poly. One (1) layer of six (6) mil poly for critical barriers per OSHA 1926.1101.

5. Seal all openings to windows, doorways, wall penetrations and any other penetrations that are not going to be abated with one layer of 6 mil poly.

6. Install separation barriers inside tunnel in the basement using plywood or similar rigid barrier and two (2) layers of six (6) mil poly sealed to the duct.

7. Perform pre-cleaning by wet-wiping and HEPA vacuuming all surfaces within the work area.

8. Cover all openings and fixed equipment including the HVAC systems located within the room with two layers of 6 mil poly. Secure the poly to allow access underneath the HVAC units to abate the floor tile and mastic. Contractor shall be responsible for any damages to immovable equipment/furnishings.

9. Construct an attached three-chamber worker decontamination enclosure and air lock at entrance to the work area on each floor using 2 in x 4 in wood framing and plywood covered with two layers of six (6) mil poly. The entrance and exit to each chamber of the decontamination unit is to have overlapping triple flaps. Post OSHA asbestos warning signs at the entrance to the decontamination unit. Provide an additional drop cloth at the end of each shift. Provide a lockable door to prevent an unauthorized access into the contained area.

10. Make the connection to potable water for use in the work area and the decontamination enclosure. (Note: The Contractor shall provide hot and cold water to the decontamination unit shower throughout the duration of the project. Control of the hot water shall be at the shower head.) Coordinate location with building owner’s representative. Water shall be shut off and disconnected at the end of each shift.

11. Provide dual stage filtration on shower unit and route discharge to drain or sanitary connection as shown on drawings.

12. Electrical equipment and panels within the contained area shall be de-energized (locked and tagged out) and protected using two layers of six (6) mil poly. Where electrical panels/equipment within the work area cannot be de-energized, cover with ¼” plywood and two layers of 6 mil fire retardant poly covering the plywood. Protect sprinkler heads, alarm systems, and other fragile equipment.

13. Minimize any damage to walls by first scoring the baseboard prior to removal.

14. Provide negative pressure to the work area to ensure a minimum of four air changes per hour and -0.02” w.c. Provide a manometer with strip chart recorder and readable tape in accordance with IDPH. Maintain negative pressure equipment and manometer in operation until final air clearance is given following abatement in each area. Route all negative air exhaust to the building exterior through the windows. Secure all doors using plywood. The negative air exhaust shall be in operation throughout the duration of the project until clearance results are obtained.

15. Minimize any damage to interior finishes including ceilings and walls (such as when removing baseboard by first scoring the baseboard prior to removal).

16. Asbestos Contractor shall place one layer of six (6) mil poly up for walls and one layer of six (6) mil poly for the ceiling that is not cleanable surface (i.e., suspended or lay-in ceiling tiles). Support poly with 2 in x 4 in wood framing or similar.
17. Ensure the abatement area is prepped securely and all areas properly sealed.
18. Conduct daily smoke testing of containment.
19. Once containment and decontamination unit have been prepped and under negative pressure, remove carpeting and abate ACM mastic only located under load-out unit and then install load-out unit prior to continuing with the abatement.
20. Construct an attached two-stage load-out using 2 in x 4 in wood framing and plywood covered with two layers of six (6) mil poly. The entrance and exit to each chamber of the load-out is to have overlapping triple flaps. Post OSHA asbestos warning signs at the exit from the load-out. Provide an additional drop cloth during every load-out. Provide a lockable door to prevent an unauthorized access into the contained area.
21. Use proper work practices approved by OSHA & EPA in removing the concrete and ACM vapor barrier.

3.2 RESPIRATORS

A. Upon request of the worker, the Asbestos Contractor shall provide the worker with a respirator and protective clothing based on the negative exposure assessment.

B. Whenever respirators are used, provide evidence of worker training, respirator fit testing, medical surveillance programs and written respiratory protection program.

3.3 DESCRIPTION OF WORK PRACTICES

A. All licensed asbestos workers entering the regulated area for abatement shall don appropriate personal protective clothing and equipment (disposable suits, gloves, respirators, etc.). Asbestos Contractor shall comply with all OSHA Respiratory Protection, PPE and HAZCOM Standards.

B. Following visual inspection by the Supervisor, the Asbestos Contractor shall start removal of ACM as shown on the drawings.

C. Provide prompt clean-up of all debris immediately following removal and generated ACM waste daily. Do not allow the material to dry out or remain in the restricted area overnight. Seal all ACM in properly labeled containers. Clean outside of the containers and move to dumpster immediately. Do not store outside the restricted area. All ACM waste shall be removed daily and taken directly from the work area to the dumpster.

D. Perform wet cleaning and HEPA. All poly, critical seals and barriers shall remain intact until approval of final visual inspection has been conducted by the Supervisor.

E. Supervisor shall perform a visual inspection of the work area prior to removal of all barriers. APM/ASP shall conduct final air clearance sampling as Section 01 77 40 Work Area Clearance.

F. Upon final visual inspection, the Asbestos Contractor will restore and release each area back to the facility for renovation work (Section 855.520) to follow which includes:

1. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area
protection. If significant quantities, as determined by the Owner's Representative, are found then the entire area affected shall be decontaminated.

2. Remove all equipment, materials, debris from the work site.

3. Dispose of all asbestos-containing waste material as specified in Section 02 82 12 Disposal of Asbestos-Containing Waste Material.

4. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

5. Remove the poly, but the plywood barriers separating the Work Area from the rest of the building shall remain until the unit has been completed.

3.4 DISPOSAL

A. Asbestos Contractor shall adequately wet and bag or seal all ACM waste ion two (2) layers of six (6) mil poly or double-lined fiber drums, to prevent breakage.

B. Bags containing asbestos containing waste shall have required EPA, DOT, and OSHA labels. Label all bags or containers containing asbestos debris as follows:

   University of Illinois, Urbana-Champaign  
   Ice Arena  
   406 East Armory Avenue  
   Champaign, Illinois 61820

C. Provide enclosed, poly-lined, and locked containers for disposal of ACM waste. Line dumpster using two (2) layers of six (6) mil poly and placed with proper markings and signage. All waste load-out shall be coordinated with the Owner to minimize disturbance of normal work activities. Pathways from work area to dumpster shall be restricted using barrier tape.

D. Restrict access by using asbestos barrier tape or other approved signs for the pathway used to transport waste in cart to dumpster. Workers transporting the waste from the cart to the dumpster shall wear proper personal protective equipment to include suits and respirators in accordance with OSHA 1926.1101. During waste disposal to the dumpster, coveralls shall be navy in color.

E. Whenever trucks or dumpsters are being loaded or unloaded with asbestos waste, post signs in accord with the 1990 NESHAP STANDARD - DANGER, ASBESTOS DUST HAZARD, CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY.

   1. Promptly transport all waste to an IEPA approved landfill. Complete a Waste Shipment Record (WSR) for each load of waste in accord with the 1990 NESHAP STANDARD. Return the record, signed by waste disposal site owner/operator to APM. Contractor shall submit to the APM a copy of the WSR (waste manifest log) within ten (10) days of completion of the project. WSR shall be signed and dated by the Contractor, Waste Transporter, and the Landfill Operator.

F. All hauling, transportation, labeling, and disposal shall be conducted in full accordance with DOT and IDOT regulations.
G. Repair all damage caused by the abatement work. Restore to original conditions.

3.5 ASBESTOS CONTRACTOR RELEASE CRITERIA

A. The asbestos abatement work area is cleared when the work area is visually clean and documented by the Asbestos Supervisor and that airborne asbestos structure concentrations have been reduced to below the clearance level of 0.01 fiber/cubic meter.

3.6 RE-ESTABLISHMENT OF WORK AREA. Perform work in accordance with Rules and Regulations for Asbestos Abatement, Part 855.520.

3.7 SUBMITTALS

A. Asbestos Contractor shall submit the following to the APM/ASP within ten (10) days of final air clearances:

1. Supervisor’s daily logs.
2. Visitor and decon sign-in sheets.
3. Filter change logs (PPE, HEPA vacuum, AFD, etc.).
5. OSHA personal air sampling results.
7. Material Safety Data Sheets for all chemicals used.
8. Project Record Documents.

3.8 REFERENCE

A. Asbestos Bulk Sampling and Lead-Based Testing Report (dated September 10, 2013) – Please refer to this report to determine if suspect material that may be disturbed has been sampled. If the material is not in this report, inform the UIUC Project Manager & PSC so it be addressed and sampled.

B. Limited Asbestos Bulk Sampling & Brine Solution Report (dated November 16, 2015) – Please refer to this report to determine if suspect material that may be disturbed has been sampled. If the material is not in this report, inform the UIUC Project Manager & PSC so it be addressed and sampled.

3.9 ATTACHMENTS


END OF SECTION 02 80 00.
SECTI0N 02 82 12 – DISPOSAL OF ASBESTOS WASTE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.
   B. Section 010600 Regulatory Requirements describes applicable federal, state and local regulations.

1.2 DESCRIPTION OF THE WORK
   A. This section describes the disposal of Asbestos-Containing Materials. Disposal includes packaging of asbestos-containing waste materials. Disposal shall be accomplished by land filling.
   B. General/Asbestos Contractor shall provide documentation of arrangements made with waste hauler and landfill that will be receiving asbestos waste. All dump receipts, trip tickets, transportation manifests, and/or other documentation of disposal shall be submitted to the APM/ASP. EPA waste shipment forms shall be completed by the Abatement Contractor, transporter, and disposal site for each load of asbestos material which leaves the site. A complete copy of the forms shall be submitted to the APM/ASP and University within ten (10) days.
   C. All hauling, transportation, labeling, and disposal shall be conducted in full accordance with DOT and IDOT regulations.

1.3 SUBMITTALS
   A. Before Start of Work: Submit the following to the Asbestos Project Designer for review:
      1. Copy of state or local license for waste hauler.
      2. Name and address of landfill where asbestos-containing waste materials are to be buried. Include contact person and telephone number.
   B. Within ten (10) working days after the waste has been transported to the landfill, the Asbestos Contractor shall submit copies of all manifests and disposal site receipts to Asbestos Project Designer.
   C. General/Asbestos Contractor shall submit to the APM/ASP within ten (10) days of final clearance:
      1. Supervisor’s daily logs.
      2. Visitor and decon sign-in sheets.
      3. Filter change logs (PPE, HEPA vacuum, AFD, etc.).
      4. Manometer readable tapes.
      5. Waste manifests.
      6. OSHA personal air sampling results.
      7. Equipment specification sheets.
      8. Safety Data Sheets for all chemicals used.
9. Project Record Documents.

PART 2 - PRODUCTS

2.1 GENERAL

A. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled with four labels with text as follows:

1. First Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA’s Hazard Communication standard:

   DANGER
   CONTAINS ASBESTOS FIBERS
   AVOID CREATING DUST
   CANCER AND LUNG DISEASE HAZARD
   AVOID BREATHING AIRBORNE ASBESTOS


   RQ HAZARDOUS
   SUBSTANCE,
   SOLID, NOS,
   ORM-E, NA 2212
   (ASBESTOS)


4. Fourth Label: With generators name and address visible on or between bags.

   University of Illinois, Urbana-Champaign
   Ice Arena
   406 East Armory Avenue
   Champaign, Illinois 61820

B. Double-lined burlap bags, fiberboard drums, or metal drums (if required by local regulations) for sharp ACM materials.

C. Use appropriate leak-tight containers for disposal of ACM waste.

PART 3 - EXECUTION

3.1 RELATED SECTIONS

A. Comply with the following sections during all phases of this work:

1. Section 01 35 27 - Worker Protection.
2. Section 01 35 28 - Respiratory Protection.
A. All waste is to be hauled by a waste hauler with all required licenses from all state and local authority with jurisdiction. Do not leave any removed ACM in the containment. All removed ACM shall be containerized prior to the end of shift.

B. Load all asbestos containing waste material in disposal bags or leak-tight drums. All materials are to be contained in one (1) of the following:

1. Two (2) 6 mil disposal bags and a fiberboard drum.
2. Or sharp edged components may be placed in burlap or two (2) layers of reinforced plastic and then in two (2) 6 mil disposal bags.

C. The containers shall not be filled more than forty (40) percent by volume to avoid rupturing. The containers shall be maintained adequately wet with amended water. The bag will be collapsed to remove air that may contribute to bursting. A HEPA vacuum shall be used to evacuate the air. The bags shall be goose-necked and taped. The exterior of the bag shall be wet-cleaned to remove gross debris. The sealed bag shall be double-bagged, sealed by goose-necking and taping, and a generator label placed on bags.

D. Line dumpster using two layers of six (6) mil poly. All waste load-out shall be coordinated with the University to minimize any disturbance to normal work activities. Pathway from work area to dumpster shall be restricted using barrier tape. Place asbestos signs on all sides of the dumpster.

E. Provide poly-lined and covered cart when transporting waste from within the building to the waste hauler. When transferring waste from cart to waste hauler, provide black poly barrier and regulate area with asbestos danger signs/barrier tape around the entrance to the waste hauler. Workers shall don PPE when transferring waste from cart to waste hauler as required by OSHA 1926.1101. During waste disposal to the dumpster, coveralls shall be navy in color.

F. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.

G. Do not store containerized materials outside of the Work Area. Take containers from the Work Area directly to a sealed truck or dumpster. Dumpster shall be locked when unattended.

H. Do not transport disposal bagged materials on open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as asbestos-containing waste and dispose of in accordance with this specification:

1. Drums shall be placed on level surfaces in the dumpster and packed tightly to prevent shifting and tipping. Containers shall not be thrown into the dumpsters.

I. Advise the landfill operator or processor, at least ten (10) days in advance of transport, of the quantity of material to be delivered.

J. At disposal site unload containerized waste. Sealed plastic bags shall be carefully unloaded from the truck. If bags are broken or damaged, return to work site for re-
bagging. Clean entire truck and contents using procedures as set forth on 017423 Construction Cleaning.

K. Retain receipts from landfill or processor for materials disposed of.

L. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Asbestos Project Designer. All disposal receipts must be submitted within one week of the completion of the project.

END OF SECTION 02 82 12
Section 02 90 00 - Lead Removal

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid: Contractor provide:

1. Complete removal and disposal of lead (in accordance with HUD/EPA standards) beams and railings in accordance with OSHA Lead Standard (1926.62) and EPA disposal regulations. The Asbestos Bulk Sampling and Lead-Based Paint Testing Report dated September 10, 2013 identifies the locations of the lead (as defined by HUD/EPA) paint in the Ice Arena that may be affected by this project.

2. Stabilize around all openings.

B. By Others:

1. Owner:
   a. Coordinate all work activities.
   b. Execute all contracts and change orders.
   c. Shut down of all existing power and lighting (including emergency) to the regulated area.
   d. Prepare payments for all work.
   e. Authorize the work to be conducted.
   f. Remove all non-contaminated equipment and supplies from the areas of abatement prior to the commencement of any abatement activities.
   g. Perform its responsibilities in accord with referenced parts of this Specification.
   h. Provide authorization of any temporary utility connections.
   i. Move all previously cleaned equipment and supplies back into accepted cleaned areas.

2. Architect
   a. Work with Owner to coordinate all work activities.
   b. Review and approve submittals.
   c. Review and provide to Owner any changes to Work.

3. Environmental Consultant:
   a. Perform Duties of Project Manager (PM) and Lead Risk Assessor (LRA).

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Specified elsewhere:
   1. 01 41 00 - Regulatory Requirements.
   2. 01 42 00 - Definitions ACM, Lead & Hazardous Waste
   3. 01 74 23 - Construction Cleaning.

1.3 REGULATORY REQUIREMENTS

A. EPA and OSHA Rules and Regulations.

B. Following regulations:


C. Federal Requirements:

1. EPA – Environmental Protection Agency
2. OSHA - Occupational Safety and Health Administration
3. DOT - Department of Transportation.

1.4 EXISTING CONDITIONS

A. Owner will remove all equipment, supplies, and furniture in affected areas.

1.5 QUALITY CONTROL

A. AIR MONITORING

1. Periodic air monitoring may be conducted by the Environmental Consultant to determine the current levels of lead dust during the construction if required by the Owner.

2. Contractor shall conduct personal air sampling as required by OSHA 1926.62.
   a. Provide air monitoring of own personnel and provide a copy of all results to the PM within twenty-four (24) hours.
   b. The minimum number of samples taken daily will include, at least one 8 hour time-weighted average for each classification of work (ie; prep work, removal, and cleaning).

B. Contractor shall:

1. Be confined to the regulated work areas as much as possible. The Owner's activities must be allowed to continue as normal and shall be minimally inconvenienced to the extent possible.

2. Provide protection for the building and occupants in accord with the OSHA lead standard.

3. Pre-cleaning the work area.


5. The Supervisor will perform regular and routine inspections both inside and outside the work area throughout the Project to include work area inspections.

6. The Supervisor will perform a thorough inspection at the completion of the final cleaning in each regulated area and prior to his request for the Environmental Consultant to perform the final visual inspection, if requested by the Owner.

7. The PM may request the Supervisor to accompany him or perform independent inspections within or outside the work area at any time. No workers will be permitted to act on the behalf of the Supervisor. The Supervisor shall also accompany the Environmental Consultant during the final clearances, if clearances are requested by the Owner.
8. Isolation of the work site to a confined area. All work barriers and warning signs are to be in place prior to the abatement.

9. Pay any additional costs and/or expenses, which arise from failure of clearance testing if required by the Owner; including costs for services of Environmental Consultant, lab analysis, and shipping.

10. Emergency planning shall be developed prior to abatement initiation and agreed to by Contractor, Owner, and Environmental Consultant.
   a. Emergency procedures shall be in written form and prominently posted in the clean room of the worker decontamination unit. Everyone prior to entering the work area must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures.
   b. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities, work schedule, and layout of the work area, particularly any barriers that may affect response capabilities.
   c. Emergency planning shall include considerations of weather, fire, explosion, toxic atmospheres, electrical hazards, slips, trips, falls, confined spaces, and heat-related injuries. Written procedures shall be developed and employee training in procedures shall be provided.
   d. Employees shall be trained in evacuation procedures in the event of workplace emergencies for both non-life-threatening and life-threatening situations.
   e. Emergency planning shall include provisions for respirator failure and other PPE failures.
   f. Each work area shall have at least two (2) emergency exits to safely exit the population.

1.6 SUBMITTALS

A. Contractor’s workers disturbing the lead shall have lead training as required by OSHA regulations.

B. Contractor shall make all submittals to the Environmental Consultant at least ten (10) business prior to commencement of work.

1. Authorization to Proceed Letter from UIUC and Prime Contractor.
2. Project Directory listing emergency phone numbers.
3. Photocopy of insurance.
4. Submit documented evidence that each person, including the Contractor's supervisor, performing lead work holds current accredited training certifications.
5. Photocopy of medical approval to wear respirators and personal protective equipment.
7. Photocopy of respirator fit testing.
8. Landfill permit and arrangements for waste disposal.
9. Use of rental equipment:
   a. If to be used: Copy of notification to the rental company to inform them of the nature of the use of the equipment.
   b. If not to be used: Letter stating none will be used.
10. List of equipment to be used (including all NIOSH approved equipment).
11. Safety Data Sheets.

1.7 SEQUENCING / SCHEDULING
A. The contractor is required to complete all work through Substantial Completion/Final Acceptance, and in accord with the contract.

B. Contractor to coordinate work with the Owner.

C. Work shall be performed as specified herein, indicated on drawings.

D. Contractor shall coordinate schedule with other contractors, A/E, Environmental Consultant, and Owner.

1.8 WARRANTY. Warrant all work in accord with General Conditions for a time period of one year.

PART 2 - PRODUCTS

2.1 LEAD ABATEMENT EQUIPMENT: Use only materials and equipment complying with the OSHA Regulations 1926.62, safe lead work practices and as specified herein.

A. Amended water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the lead material and retardation of lead dust release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. For floor covering removal a substitute of a detergent solution (sixteen (16) ounces of liquid dish washing detergent to one gallon of warm water) may be used.

B. A sufficient supply of hand tools (e.g., scrapers, plastic shovels, etc.) and rubber dustpans/squeegees shall be provided as needed.

C. Sprayers with pumps capable of providing 500 pounds per square inch (psi) at the nozzle tip at a flow rate of 2 gallons per minute for spraying amended water.

D. A sufficient supply of HEPA filtered vacuum systems shall be available.

E. A sufficient supply of HEPA filters and pre-filters for the negative air machines shall be available.

F. Tri-sodium phosphate solution for cleaning purposes.

2.2 ACCEPTABLE MANUFACTURERS/PRODUCTS

A. Wetting agent.
   1. Certified Technologies Certane 2075
   2. Eppert Oil Co. Speedi-Wet
   3. Foster Products Corp 32-90

B. Combination wetting agent - encapsulant.
   1. Certified Technologies Certane 707
   2. Eppert Oil Co. Fiber-Seal
   3. Foster Products Corp 32-60

C. Polyethylene Sheeting:
   1. Clear, 0.006 inches (6 mil) thick.
   2. Black, 0.006 inches (6 mil) thick.
   3. Opaque, 0.006 inches (6 mil) thick.

D. Safety Data Sheets:
   UIUC_Ice Arena Portable Ice System 02 90 00 - 4
   UI PROJ. NO.: U15086
   BIDDING
   November 17, 2015
1. Contractor shall submit to the Environmental Consultant at least ten (10) days prior to the commencement of the project, current Safety data Sheets on all products used in the performance of this contract.

PART 3 - EXECUTION

3.1 PREPARATION

A. Perform all preparation work in accordance with the all applicable regulations that include OSHA Regulations, 29 CFR 1926.62 and use safe lead work practices.

B. WORK AREA PREPARATION

1. Construct barriers to isolate the work areas and restrict access per OSHA 29 CFR 1926.62. The work area will be restricted to building occupants during the lead removal activities.
2. Post OSHA lead warning sign at all entrances/openings to the work area.
3. Coordinate with the building owner the shut down of all electrical power and lighting and provide temporary electrical power to the work areas which are ground fault protected (G.F.C.I.) located within the work area. A licensed electrician will make the temporary electrical connections for the Contractor. The Contractor shall be responsible for maintaining the temporary power connections during the project.
4. Coordinate with the building owner the shut down/isolation of HVAC systems which service and/or are located within the work area. Cover the HVAC ducts and openings with two layers of six (6) mil poly. Seal any system components that pass through the work area with two layers of six (6) mil poly.
5. Seal all openings to windows, doorways, wall penetrations and any other penetrations with one layer of 6 mil poly.
6. Perform pre-cleaning by wet-wiping and HEPA vacuuming all surfaces within the work area.
7. Cover all openings and fixed equipment including the HVAC systems located within the work area with two layers of 6 mil poly. Contractor shall be responsible for any damages to immoveable equipment/furnishings.
8. Electrical equipment and panels within the work area shall be de-energized (locked and tagged out) and protected using two layers of six (6) mil poly. Where electrical panels/equipment within the work area cannot be de-energized, cover with ½” plywood and two layers of 6 mil fire retardant poly covering the plywood. Protect sprinkler heads, alarm systems, and other fragile equipment.
9. Place drop cloths under all affected lead areas.
10. Use proper work practices and HEPA vacuums to minimize the dispersion of lead dust as required in the OSHA regulations.

3.2 RESPIRATORS

A. Upon request of the worker, the Contractor shall provide the worker with a respirator and protective clothing based on the negative exposure assessment.

B. Whenever respirators are used, provide evidence of worker training, respirator fit testing, medical surveillance programs and written respiratory protection program.

C. Contractor shall comply with OSHA 1910.134 respirator protection.

3.3 DESCRIPTION OF WORK PRACTICES

A. All trained lead workers entering the work area shall don appropriate personal protective
clothiing and equipment (disposable suits, gloves, respirators, etc.). Contractor shall comply with all OSHA regulations, including but not limited to, OSHA Respiratory Protection, PPE and HAZCOM Standards.

B. Following visual inspection by the Supervisor of the containment, the contractor shall start removal of openings into the lead walls.

C. Provide prompt clean-up of all debris immediately following removal and generated lead waste daily. Do not allow the material to dry out or remain in the work area. Seal all waste in properly labeled containers. Clean outside of the containers and move to area adjacent to the load-out. All waste shall be removed from the building daily. Lead waste shall be placed in a locked, covered, lined (2 layer of six mil poly) special waste container with proper markings. Restrict access by using approved signs for the pathway used to transport waste in cart to dumpster. Workers transporting the waste from the cart to the dumpster shall wear proper personal protective equipment to include suits and respirators.

D. Perform wet-cleaning and HEPA. All ceiling poly, critical seals and barriers shall remain intact until approval of final clearance monitoring is given.

E. Supervisor shall perform a visual inspection of the work area.

F. If clearances are required by the Owner, Supervisor shall accompany LRA during final clearances. Notification of “pass” or “fail” shall be provided to the contractor.

G. If final clearances are required by the Owner, the contractor will restore and release each area back to the facility for renovation work after notification of passing the clearance testing to follow which includes:

1. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Owner's Representative, are found then the entire area affected shall be decontaminated.

3. Remove all equipment, materials, debris from the work site.

4. Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

5. Remove the Critical Barriers separating the Work Area from the rest of the building.

3.4 DISPOSAL

A. All hauling, transportation, labeling, and disposal shall be conducted in full accordance with DOT and IDOT regulations.

B. Conduct Toxicity Characteristic Leachate Procedure (TCLP) analysis as required by the landfill. Comply with the requirements of the landfill.

C. Lead materials cannot be recycled or used as fill. If the lead paint is intact, then the material can be disposed of as general construction debris. Contractor shall comply with the most current local, state and federal regulations for the disposal of lead containing materials.

D. Bags or containers with lead waste shall have required EPA, DOT, and OSHA labels.

E. Promptly transport all waste to an IEPA approved landfill. Complete a Waste Shipment Record (WSR) for each load of waste in accord with the regulations. Return the record, signed by waste disposal site owner/operator to PM. Contractor shall submit to the PM a
copy of the WSR (waste manifest log) within ten (10) days of completion of the project. WSR shall be signed and dated by the Contractor, Waste Transporter, and the Landfill Operator.

F. All waste is to be hauled by a waste hauler with all required licenses form all state and local authority with jurisdiction.

G. Load all lead waste in disposal bags or leak-tight drums. All materials are to be contained in one of the following:
   1. Two 6 mil disposal bags and a fiberboard drum or
   2. Sharp edged components may be placed in burlap or two layers of reinforced plastic and then in two 6 mil disposal bags.

H. The containers shall not be filled more than forty (40) percent by volume to avoid rupturing. The containers shall be maintained adequately wet with amended water. The bag will be collapsed to remove air that may contribute to bursting. A HEPA vacuum shall be used to evacuate the air. The bags shall be goose-necked and taped. The exterior of the bag shall be wet-cleaned to remove gross debris. The sealed bag shall be double-bagged, sealed by goose-necking and taping, and a generator label placed on bags.

I. Provide poly-lined and covered cart when transporting waste from within the building to the waste hauler.

J. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.

K. Advise the landfill operator or processor, at least ten (10) days in advance of transport, of the quantity of material to be delivered.

3.5 RE-STABLISHMENT OF WORK AREA. Perform work in accordance with Rules and Regulations for OSHA 1926.62.

3.6 SUBMITTALS

A. Before Start of Work: Submit the following to the LRA for review at least ten (10) days prior to the start of work.
   1. Copy of state or local license for waste hauler.
   2. Name and address of landfill where lead waste are to be buried. Include contact person and telephone number.

B. Contractor shall submit the following to the PM within ten (10) days of final work area:
   1. Supervisor’s daily logs.
   2. Visitor sign-in sheets.
   3. Filter change logs (PPE, HEPA vacuum, AFD, etc.).
   5. OSHA personal air sampling results.
   7. Safety Data Sheets for all chemicals used.
   8. Project Record Documents.

3.7 REFERENCES
A. The Contractor shall review the Asbestos Bulk Sampling and Lead-Based Paint Testing Report in order to determine if a suspect material that may be disturbed contains asbestos and/or lead prior to disturbance. If the suspect material is not included in this report, please notify the Environmental Consultant immediately for confirmation. If the suspect material has not been sampled and analyzed, the Environmental Consultant will conduct the sampling as soon as practicable and provide the results. DO NOT DISTURB THE SUSPECT MATERIAL UNTIL RESULTS HAVE BEEN RECEIVED FROM THE ENVIRONMENTAL CONSULTANT.

END OF SECTION 02 90 00.
PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid: Contractor provide:
   1. Complete removal and disposal of 4,000 gallons of brine system (includes sodium dichromate) in the lower level mechanical room tank in accordance with OSHA HAZWOPER Standard (1910.120) and EPA disposal regulations.

B. By Others:
   1. Owner:
      a. Coordinate all work activities.
      b. Execute all contracts and change orders.
      c. Prepare payments for all work.
      e. Authorize the work to be conducted.
      f. Remove all non-contaminated equipment and supplies from the areas of abatement prior to the commencement of any abatement activities.
      g. Perform its responsibilities in accord with referenced parts of this Specification.
      h. Provide authorization of any temporary utility connections.
      i. Move all previously cleaned equipment and supplies back into accepted cleaned areas.

2. Architect
   a. Work with Owner to coordinate all work activities.
   b. Review and approve submittals.
   c. Review and provide to Owner any changes to Work.

3. Environmental Consultant:
   a. Perform Duties of Project Manager (PM).

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Specified elsewhere:
   1. 01 41 00 - Regulatory Requirements.
   2. 01 42 00 - Definitions ACM, Lead & Hazardous Waste

1.3 REGULATORY REQUIREMENTS

A. EPA and OSHA Rules and Regulations.

B. Following regulations:

C. Federal Requirements:
   1. EPA – Environmental Protection Agency
2. OSHA - Occupational Safety and Health Administration
3. DOT - Department of Transportation.

1.4 EXISTING CONDITIONS

A. Owner will remove all equipment, supplies, and furniture in affected areas.

1.5 QUALITY CONTROL

A. AIR MONITORING

1. Periodic air monitoring may be conducted by the Environmental Consultant to determine the current levels of lead dust during the construction if required by the Owner.

2. Contractor shall conduct personal air sampling as required by OSHA 1910.120.
   a. Provide air monitoring of own personnel and provide a copy of all results to the PM within twenty-four (24) hours.

B. Contractor shall:

1. Be confined to the regulated work areas as much as possible. The Owner’s activities must be allowed to continue as normal and shall be minimally inconvenienced to the extent possible.

2. Provide protection for the building and occupants in accord with the OSHA HAZWOPER standard.

3. Pre-cleaning the work area.


5. The Supervisor will perform regular and routine inspections both inside and outside the work area throughout the Project to include work area inspections.

6. The Supervisor will perform a thorough inspection at the completion of the final cleaning in each regulated area and prior to his request for the Environmental Consultant to perform the final visual inspection, if requested by the Owner.

7. The PM may request the Supervisor to accompany him or perform independent inspections within or outside the work area at any time. No workers will be permitted to act on the behalf of the Supervisor. The Supervisor shall also accompany the Environmental Consultant during the final clearances, if clearances are requested by the Owner.

8. Isolation of the work site to a confined area. All work barriers and warning signs are to be in place prior to the abatement.
9. Pay any additional costs and/or expenses, which arise from failure of clearance testing if required by the Owner; including costs for services of Environmental Consultant, lab analysis, and shipping.

10. Emergency planning shall be developed prior to abatement initiation and agreed to by Contractor, Owner, and Environmental Consultant.
   a. Emergency procedures shall be in written form and prominently posted in the clean room of the worker decontamination unit. Everyone prior to entering the work area must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures.
   b. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities, work schedule, and layout of the work area, particularly any barriers that may affect response capabilities.
   c. Emergency planning shall include considerations of weather, fire, explosion, toxic atmospheres, electrical hazards, slips, trips, falls, confined spaces, and heat-related injuries. Written procedures shall be developed and employee training in procedures shall be provided.
   d. Employees shall be trained in evacuation procedures in the event of work place emergencies for both non life-threatening and life-threatening situations.
   e. Emergency planning shall include provisions for respirator failure and other PPE failures.
   f. Each work area shall have at least two (2) emergency exits to safely exit the population.

1.6 SUBMITTALS

A. Contractor’s workers shall have HAZWOPER training as required by OSHA regulations.

B. Contractor shall make all submittals to the Environmental Consultant at least ten (10) business prior to commencement of work.

1. Authorization to Proceed Letter from UIUC and Prime Contractor.
2. Project Directory listing emergency phone numbers.
3. Photocopy of insurance.
4. Submit documented evidence that each person, including the Contractor’s supervisor, performing hazardous waste removal holds current accredited training certifications.
5. Photocopy of medical approval to wear respirators and personal protective equipment.
7. Photocopy of respirator fit testing.
8. Landfill permit and arrangements for waste disposal.
9. Use of rental equipment:
   a. If to be used: Copy of notification to the rental company to inform them of the nature of the use of the equipment.
   b. If not to be used: Letter stating none will be used.
10. List of equipment to be used (including all NIOSH approved equipment).
11. Safety Data Sheets.

1.7 SEQUENCING / SCHEDULING
A. The contractor is required to complete all work through Substantial Completion/Final Acceptance, and in accord with the contract.

B. Contractor to coordinate work with the Owner.

C. Work shall be performed as specified herein, indicated on drawings.

D. Contractor shall coordinate schedule with other contractors, A/E, Environmental Consultant, and Owner.

1.8 WARRANTY. Warrant all work in accord with General Conditions for a time period of one year.

PART 2 - PRODUCTS

2.1 HAZWOPER EQUIPMENT: Use only materials and equipment complying with the OSHA Regulations 1910.120

2.2 ACCEPTABLE MANUFACTURERS/PRODUCTS

A. Safety Data Sheets:

1. Contractor shall submit to the Environmental Consultant at least ten (10) days prior to the commencement of the project, current Safety Data Sheets on all products used in the performance of this contract.

PART 3 - EXECUTION

3.1 PREPARATION

A. Perform all preparation work in accordance with the all applicable regulations that include OSHA Regulations, 29 CFR 1910.120.

B. WORK AREA PREPARATION

1. Construct barriers to isolate the work areas and restrict access per OSHA 29 CFR 1910.120. The work area will be restricted to building occupants during the lead removal activities.

2. Post warning signs at all entrances/openings to the work area.

3. Coordinate with the building owner the shut down of all electrical power and lighting and provide temporary electrical power to the work areas which are ground fault protected (G.F.C.I.) located within the work area, if needed. A licensed electrician will make the temporary electrical connections for the Contractor. The Contractor shall be responsible for maintaining the temporary power connections during the project.

4. Coordinate with the building owner the shut down/isolation of HVAC systems which service and/or are located within the work area.

5. Contractor shall be responsible for any damages to immovable equipment/furnishings.

6. Electrical equipment and panels within the work area shall be de-energized (locked and tagged out) and protected using two layers of six (6) mil poly. Where electrical panels/equipment within the work area cannot be de-energized, cover with ½" plywood and two layers of 6 mil fire retardant poly covering the plywood. Protect sprinkler heads, alarm systems, and other fragile equipment.
7. Use proper work practices to minimize the dispersion of chemicals as required in the OSHA regulations.

3.2 RESPIRATORS

A. Upon request of the worker, the Contractor shall provide the worker with a respirator and protective clothing based on the negative exposure assessment.

B. Whenever respirators are used, provide evidence of worker training, respirator fit testing, medical surveillance programs and written respiratory protection program.

C. Contractor shall comply with OSHA 1910.134 respirator protection.

3.3 DESCRIPTION OF WORK PRACTICES

A. All trained HAZWOPER workers entering the work area shall don appropriate personal protective clothing and equipment (disposable suits, gloves, respirators, etc.). Contractor shall comply with all OSHA regulations, including but not limited to, OSHA Respiratory Protection, PPE and HAZCOM Standards.

B. Following visual inspection by the Supervisor of the brine system, the contractor shall start removal of the chemicals.

C. Provide prompt clean-up of all debris immediately following removal and generated waste daily. Seal all waste in properly labeled containers. Clean outside of the containers and move to area adjacent to the load-out. All waste shall be removed from the building daily. Hazardous chemical waste shall be placed in a special waste container with proper markings. Restrict access by using approved signs for the pathway used to transport waste into container. Workers transporting the waste to the container shall wear proper personal protective equipment to include suits and respirators as required by OSHA.

D. Supervisor shall perform a visual inspection of the work area.

E. If clearances are required by the Owner, Supervisor shall accompany PM during final clearances. Notification of "pass" or "fail" shall be provided to the contractor.

F. If final clearances are required by the Owner, the contractor will restore and release each area back to the facility for renovation work after notification of passing the clearance testing to follow which includes:
   1. Remove any small quantities of residual material found. If significant quantities, as determined by the Owner's Representative, are found then the entire area affected shall be decontaminated.
   3. Remove all equipment, materials, debris from the work site.
   4. Remove the Critical Barriers/signs separating the Work Area from the rest of the building.

3.4 DISPOSAL

A. All hauling, transportation, labeling, and disposal shall be conducted in full accordance with DOT and IDOT regulations.

B. Conduct proper analysis, such as Toxicity Characteristic Leachate Procedure (TCLP) as required by the landfill. Comply with the requirements of the landfill.

C. Containers with hazardous waste shall have required EPA, DOT, and OSHA labels.
D. Promptly transport all waste to an IEPA approved landfill. Complete a Waste Shipment Record (WSR) for each load of waste in accord with the regulations. Return the record, signed by waste disposal site owner/operator to PM. Contractor shall submit to the PM a copy of the WSR (waste manifest log) within ten (10) days of completion of the project. WSR shall be signed and dated by the Contractor, Waste Transporter, and the Landfill Operator.

E. All waste is to be hauled by a waste hauler with all required licenses form all state and local authority with jurisdiction.

F. Load all lead waste in appropriate containers.

G. Carefully load containerized waste in appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.

H. Advise the landfill operator or processor, at least ten (10) days in advance of transport, of the quantity of material to be delivered.

3.5 RE-STABLISHMENT OF WORK AREA. Perform work in accordance with Rules and Regulations for OSHA 1910.120.

3.6 SUBMITTALS

A. Before Start of Work: Submit the following to the PM for review at least ten (10) days prior to the start of work.

   1. Copy of state or local license for waste hauler.
   2. Name and address of landfill where lead waste are to be buried. Include contact person and telephone number.

B. Contractor shall submit the following to the PM within ten (10) days of final work area:

   1. Supervisor’s daily logs.
   2. Visitor sign-in sheets.
   3. Filter change logs (PPE, HEPA vacuum, AFD, etc.).
   5. OSHA personal air sampling results.
   7. Safety Data Sheets for all chemicals used.
   8. Project Record Documents.

3.7 REFERENCES

A. Limited Asbestos Bulk Sampling & Brine Solution Report – Please refer to this report for the lab analysis associated with the brine solution. If suspect material that may be disturbed has been sampled. If the material is not is in this report, inform the UIUC Project Manager & PSC so it be addressed. DO NOT DISTURB THE SUSPECT MATERIAL UNTIL RESULTS HAVE BEEN RECEIVED FROM THE ENVIRONMENTAL CONSULTANT.

END OF SECTION 02 90 00.
PART 1 - GENERAL

1.1 DESCRIPTION

A. The General and Supplementary Conditions of the Construction Contract and Division 1 - General Requirements apply to the work specified in this section.

B. The work includes all items required for executing and completing the cast-in-place concrete work and related work shown on the drawings or specified herein. Work shall include, but not be limited to the following:

1. Formwork, bracing, and anchorage.
2. Concrete Reinforcement and accessories.
3. Cast-in-place concrete work.

C. Structural notes indicated on the drawings regarding Cast-In-Place concrete shall be considered a part of this specification.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified herein:

1. ACI 301 – Standard Specifications of Structural Concrete.
4. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel for Concrete Reinforcement.

B. Comply with all local building code requirements which are more stringent than those listed above. All referenced codes or standards shall be the most currently adopted as of the date for Receipt of Proposal. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
1.3 SUBMITTAL

A. In addition to the following, comply with submittal requirements in ACI 301.

1. Product Data: For each type of manufactured material and product indicated.

2. Design Mixes: For each concrete mix required for the project and all alterations to the mix designs required due to environmental conditions.

3. Shop Drawings:
   a. Submit shop drawings of reinforcing steel indicating the reinforcement sizes, spacing, locations and quantities of reinforcing steel, and wire reinforcement, bending and cutting schedules, splicing, and supporting and spacing devices.

1.4 TESTING SERVICES

A. Owner shall hire a qualified independent testing laboratory to perform all testing and analysis of the concrete work for this project.

B. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of work.

C. Testing firm will take 4 cylinders per pour and perform compressive strength, slump and air entrainment tests in accordance with building code requirements and ACI 301.

PART 2 - PRODUCTS

2.1 FORMWORK MATERIALS AND ACCESSORIES

A. Formwork materials shall conform to ACI 301.

B. Formwork accessories shall be commercially manufactured accessories for formwork that are partially or completely embedded in the concrete, including ties and hangers.

2.2 REINFORCING STEEL

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade steel plain deformed bars; uncoated finish.

B. Plain-Steel Wire: ASTM A82, as drawn.

C. Plain-Steel Welded Wire Reinforcement: ASTM A185, fabricated from as-drawn steel wire into flat sheets.


2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, normal - Type 1 Portland.
   1. Use one brand of cement throughout project.

B. Fine and Coarse Aggregates: ASTM C33 for Normal Weight Concrete, uniformly graded, not exceeding 1-1/2 inch nominal size.
C. Fly Ash: ASTM C618, Class C or F. Replacement of Portland cement with fly ash shall not exceed the following:
   1. Concrete Flatwork: 15 percent
   2. Concrete placed in cold weather as defined by ACI 306.: No fly ash allowed.
   3. All other concrete: 25 percent

D. Water: Potable and complying with ASTM C94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.05 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.


C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High- and Mid-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 RELATED MATERIALS

A. Vapor Retarder: ASTM E1745, Class C, not less than 10 mils thick.


C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.6 ACCESSORIES

A. Non-Shrink Grout: Non-shrink grout shall be pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. All constituents shall meet the requirements of these specifications. Minimum compressive strength at 28-days shall be 5,000 psi as determined by ASTM C109.

2.7 CURING MATERIALS

A. Water: Clean and potable.

B. Membrane Curing Compounds: ASTM C309.

2.8 CONCRETE MIX

A. Mix concrete in accordance with ASTM C94.
   
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Comply with ACI 301 requirements for concrete mixtures.

C. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:
   
1. Compressive Strength: (7 days): 75% of 28 day compressive strength.
2. Compressive Strength: (28 days): Refer to Drawings.
3. Weight: 150 pcf. for normal weight.
4. Slump: 1 to 4 inches for foundations, and 4 to 6 inches for slabs on grade.
   a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: 8 inch maximum.

D. Add 5.0 to 7.5 percent air-entraining agent to mix for concrete exposed to freeze-thaw cycling.
   
1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

PART 3 - EXECUTION

3.1 FORMWORK ERECTION

A. Verify lines, levels, and measurement before proceeding with formwork.

B. Align form joints.

C. Design, construct, erect, brace, and maintain formwork according to ACI 301.

D. Vapor Retarders:
   
1. Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
2. Lap joints 6 inches and seal with manufacturer's recommended tape.
3. Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.

3.2 REINFORCEMENT

A. Place, support, and secure reinforcement against displacement.
B. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.3 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

D. Control Joints in Slabs-on-Grade: Form control joints, sectioning concrete into areas as indicated in the general notes of the Drawings. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Sawed Joints: Saw cut contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.4 PLACING CONCRETE

A. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

B. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

C. Do not add water to concrete during delivery, at Project site, or during placement. Unless design mix permits.

D. Consolidate concrete in walls, columns, and piers with mechanical vibrating equipment.

3.5 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
3.6 FINISHING UNFORMED SURFACES
A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
B. Trowel Finish: Apply a hard trowel finish to slab surfaces exposed to view.

3.7 TOLERANCES
A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.8 CONCRETE PROTECTION AND CURING
A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Follow the recommendations of ACI 306.1 for cold-weather protection, and ACI 305R for hot-weather protection during curing.
B. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
C. Curing Methods: Cure formed and unformed concrete for at least seven days by using moisture-retaining-cover curing, a curing compound or a combination of these as follows:
   1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 REPAIRS
A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. The General and Supplementary Conditions of the Construction Contract and Division 1 - General Requirements apply to the work specified in this section.

B. This section includes fabrication and erection of structural steel work, as shown on the Drawings and specified herein. Work shall include, but not be limited to the following items:

1. Structural steel
2. Base and bearing plates.
3. Deck support angles and framing for roof openings.
5. All other steel items as listed in AISC – “Code of Standard Practice for Steel Buildings and Bridges” as shown on structural and architectural drawings.

C. Structural notes indicated on the drawings regarding structural steel framing should be considered a part of this specification.

D. No substitutions will be allowed without the Engineer’s approval.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified.

2. AISC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.
4. AISC - Specification for the Design of Steel Hollow Structural Sections.


13. ASTM A500 - Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.


18. ASTM F1554 - Standard Specification for Anchor Bolts, Steel 36, 55 and 105 ksi Yield Strength


20. SSPC - Steel Structures Painting Council.

B. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

C. Fabrication, Erection, and Welding Qualifications:

1. Fabricate structural steel members in accordance with AISC Specification for the design, fabrication and erection of structural steel for buildings.

2. Steel fabricator shall not have less than five (5) years of continuous experience in fabrication of structural steel framing.

3. Steel erector shall not have less than five (5) years of continuous experience in the erection of structural steel framing.

4. All welding of structural steel shall be performed by operators who have been recently qualified as prescribed in “Qualification Procedures” of the American Welding Society (AWS).

D. Tolerances: Tolerances shall be as indicated by the AISC Code of Standard Practice for Buildings and Bridges except that tolerances for fabricating, rolling, cambering and erection shall not be cumulative.

1.3 TESTING AND INSPECTION

A. Special Inspection and Testing:

1. In accordance with Chapter 17 of the International Building Code, the Owner shall employ a Special Inspection Agency to perform the duties and responsibilities specified in Section 1704.0 of the International Building Code.
2. Refer to architectural, civil, mechanical, and electrical specifications for testing and inspection requirements of non-structural components.

3. Work performed on the premises of a fabricator approved by the building official need not be tested and inspected per the table below. The fabricator shall submit a certificate of compliance that the work has been performed in accordance with the approved plans and specification to the building official and the Architect and Engineer of Record.

4. Duties of the Special Inspection Agency:
   a. Perform all testing and inspection required per approved testing and inspection program.
   b. Furnish inspection reports to the building official, the Owner, the Architect, the Engineer of Record, and the General Contractor. The reports shall be completed and furnished within 48 hours of inspected work.
   c. Submit a final signed report stating whether the work requiring special inspection was, to the best of the Special Inspection Agency’s knowledge in conformance with the approved plans and specifications.

5. Structural Component Testing and Inspection Schedule for Section 05 12 23 is as follows:

<table>
<thead>
<tr>
<th>AISC 360 – CHAPTER N: STRUCTURAL STEEL QUALITY ASSURANCE</th>
<th></th>
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<tbody>
<tr>
<td>Inspection Tasks Prior to Welding</td>
<td></td>
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<tr>
<td>Welding procedure specifications (WPSs) available</td>
<td>P</td>
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<tr>
<td>Manufacturer certifications for welding consumables available</td>
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<tr>
<td>Material identification (type / grade)</td>
<td>O</td>
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<tr>
<td>Configuration and finish of access holes</td>
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<tr>
<td>Fit-up of fillet welds</td>
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<tr>
<td>• Dimensions (alignment, gaps at root)</td>
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<tr>
<td>• Cleanliness (condition of steel surfaces)</td>
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<tr>
<td>• Tacking (tack weld quality and location)</td>
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<tr>
<td>Inspection Tasks During Welding</td>
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<tr>
<td>Use of qualified welders</td>
<td>O</td>
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<tr>
<td>Control and handling of welding consumables</td>
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<tr>
<td>• Packaging</td>
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<tr>
<td>• Exposure Control</td>
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<tr>
<td>No welding over cracked tack welds</td>
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<tr>
<td>Environmental conditions</td>
<td>O</td>
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<tr>
<td>• Wind speed within limits</td>
<td></td>
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<tr>
<td>• Precipitation and temperature</td>
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<tr>
<td>WPS followed</td>
<td>O</td>
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<tr>
<td>• Settings on welding equipment</td>
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<td>• Travel speed</td>
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<td>• Selected welding materials</td>
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<td>• Shielding gas type / flow rate</td>
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<td>• Preheat applied</td>
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<tr>
<td>• Interpass temperature maintained (min. / max.)</td>
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<tr>
<td>AISC 360 – CHAPTER N: STRUCTURAL STEEL QUALITY ASSURANCE</td>
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<tr>
<td><strong>O</strong> – Observe these items on a random basis. Operations need not be delayed pending these inspections.</td>
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<tr>
<td><strong>P</strong> – Perform these tasks for each welded joint or member.</td>
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<tr>
<td><strong>•</strong> Proper position (F,V,H, OH)</td>
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<tr>
<td><strong>Welding techniques</strong></td>
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<tr>
<td><strong>•</strong> Interpass and final cleaning</td>
<td>O</td>
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<tr>
<td><strong>•</strong> Each pass within profile limitations</td>
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<tr>
<td><strong>•</strong> Each pass meets quality requirements</td>
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</tbody>
</table>

**Inspection Tasks After Welding**

| Welds cleaned | O |
| Size, length, and location of welds | P |

**Welds meets visual acceptance criteria**

| **•** Crack prohibition | P |
| **•** Weld / base-metal fusion | P |
| **•** Crater cross section | P |
| **•** Weld profiles | P |
| **•** Weld size | P |
| **•** Undercut | P |
| **•** Porosity | P |

| **Arc strikes** | P |
| **Backing removed and weld tabs removed and finished (if required)** | P |
| **Repair activities** | P |
| **Document acceptance or rejection of welded joint or member** | P |

**Inspection Tasks Prior to Bolting**

| Manufacturer’s certifications available for fastener materials | P |
| Fasteners marked in accordance with ASTM requirements | O |
| **Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)** | O |
| **Proper bolting procedure selected for joint detail** | O |
| **Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements** | O |
| **Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used** | O |
| **Proper storage provided for bolts, nuts, washers and other fastener components** | O |

**Inspection Tasks During Bolting**

| Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required. | O |
| **Joint brought to the snug condition, placed in all holes and washers (if required) are positioned as required** | O |
| **Fastener component not turned by the wrench prevented from rotating** | O |
| **Fasteners are pretensioned in accordance with RCSC Specification, progressing systematically from the most rigid point toward the free edges** | O |

**Inspection Tasks After Bolting**

| Document acceptance or rejection of bolted connections | P |

**Other Inspection Tasks**

| Inspection during the placement of anchor rods and other embedments supporting structural steel. As a minimum, the diameter, grade, type and length of anchor rod or embedded item, and the extent or depth of embedment into the concrete shall be verified. | P |
| Inspect the fabricated steel or erected steel frame to verify compliance with the details shown on the construction documents, such as braces, stiffeners, member locations and proper application of joint details at each connection. | O |
1.4 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer’s approval, including framing plans indicating size, weight and location of all structural members. Shop drawings shall indicate methods of connecting, anchoring, fastening, bracing and attaching work of other trades.

   a. Where contract documents indicate verify in field (VIF) dimensions, shop drawings shall indicate these dimensions and Contractor shall note that the dimensions have been verified.

   b. This specification modifies the AISC Code of Standard Practice by deleting the following sentence from paragraph 4.2.1: “This approval constitutes the Owner’s acceptance of all responsibility for the design adequacy of any detail configuration of connections developed by the fabricator as part of his preparation of these shop drawings.” Review of the shop drawings by the Engineer shall not relieve the fabricator of this responsibility.

   c. This specification modifies AISC Code of Standard Practice by deleting the following sentence from 4.4.1(c): “Release by the Owner’s Designated Representatives for Design and Construction for the Fabricator to begin fabrication using the approved submittals.” Review of the shop drawings by the Engineer shall not relieve the fabricator of this responsibility.

2. Furnish both the Engineer and Architect with one copy of the following:

   a. Final shop drawings containing all review notations.

   b. Field Use/For Construction Drawings.

3. The steel fabricator shall submit a setting plan for all embedded items for Engineer’s approval.

4. Welder’s Certification: Submit certification for all welders employed on the project demonstrating they have been AWS qualified to perform the welding procedures required for this project.

5. General Contractor/Construction Manager to provide copies of field concrete cylinder breaks indicating the concrete meets 75% of the design compressive strength to the steel erector.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Steel members shall be transported, stored and erected in a manner that will avoid any damage or deformation. Materials should be stored to allow easy access for inspection and identification. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of the ground and in such a manner as to eliminate excessive handling.

B. Store fasteners in a protected location. Clean and re-lubricate bolts and nuts before use.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel:

1. All structural steel shall be free from defects impairing strength, durability or appearance. All structural steel shall meet the latest minimum requirements as follows:

   a. Structural steel shapes, bars and plates shall conform to the ASTM designations listed in the General Notes of the Drawings.

   b. Square and rectangular structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the Drawings.

B. High Strength Structural Bolts:

1. High strength structural bolts shall conform to the ASTM designations listed in the General Notes of the Drawings.

2. High strength bolts shall be detailed and installed in accordance with AISC - “Specification for Structural Joints Using ASTM A325 or A490 Bolts.”

3. Manufacturer’s symbol and grade markings shall appear on all bolts and nuts.

C. Anchoring Devices:

1. Anchor Rods: Anchor rods used with structural steel members shall be plain threaded rods conforming to the ASTM designations listed in the General Notes of the Drawings.

D. Welding Materials:

1. Type required for material being welded in conformance with AWS D1.1.

E. Paints and Primers:

1. Fabricator’s standard lead- and chromate-free, non-asphalitic, rust-inhibiting primer.


3. Refer to Specification Section 09 90 00 for additional paint requirements.

F. Non-Shrink Grout for Base and Bearing Plates: Non-shrink grout, conforming to ASTM C1107, shall be pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. All constituents shall meet the requirements of these specifications. Minimum compressive strength at 28-days shall be 7,000 psi as determined by ASTM C109. Follow manufacturer's instructions for handling, mixing, placing and curing. Acceptable products are:

1. Euclid Chemical Company - Euco N.S. Grout
2. L&M Construction Chemical - Crystex.
3. Master Builders - Masterflow 713.
4. Sonneborn - Sonnogrout.
5. Five Star Products Inc. – Five Star Grout.

2.2 FABRICATION AND MANUFACTURE

A. Fabrication Procedures:
   1. Fabricate all structural steel items in accordance with AISC Specifications and as indicated on the drawings.
   2. Properly mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize handling of materials.
   3. Complete structural steel assemblies before shop priming or galvanizing.

B. Shop Connections:
   1. All shop connections shall be welded, unless noted otherwise on drawings. Connections shall develop the full strength of the adjoining members unless detailed otherwise.
   2. All holes shall be either drilled or punched, as no burning of holes will be permitted, including the enlargement of holes. Provide all holes required for connections and for attaching the work of other trades where such holes are shown if furnished prior to fabrication.
   3. Connections shall be detailed as standard framed beam connections (bearing type) in accordance with the AISC Manual of Steel Construction - Allowable Stress Design. Connections which require oversized holes or slotted holes in which the force is other than normal to the axis of the slot shall be detailed as “Slip-Critical Connections” and noted as such on the erection drawings. Provide bearing plates and end anchorage for beams resting on masonry.

C. Galvanizing:
   1. Hot-Dip Galvanized Finish: Apply Zinc coating by the hot-dip process to structural steel according to ASTM A 123.
      a. Fill vent holes and grind smooth after galvanizing.
      b. Unless otherwise noted on drawings or in Division 9, all exterior steel components exposed to the elements shall be galvanized, including, but not limited to, lintels.

PART 3 - EXECUTION

3.1 ERECTION

A. Erection Procedures:
   1. The erector and not the structural engineer of record shall be responsible for the means, methods and safety of erection of the structural steel framing.
   2. Erection of all structural steel items shall meet the requirements of AISC “Specification and Code of Standard Practice.”
3. All work shall be erected square, plumb, straight and true, accurately fitted and with tight joints and intersections, by mechanics experienced in the erection of structural steel. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

4. All base plates shall be supported on steel wedges, steel shims or heavy duty leveling nuts until the supported members have been leveled and plumbed.
   a. Snug tighten anchor rods after supported members have been positioned and plumb. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
   b. Promptly place non-shrink grout between bearing surfaces and base plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturers written installation instructions for shrinkage-resistant grouts.

5. Field connections of structural work shall be made with either high strength bolts (bearing type) or by welding. Proper precaution shall be taken to ensure that anchored items will not be distorted or overstressed due to improperly fabricated items.

6. Do not use thermal cutting during erection unless approved by the Engineer in writing.

7. Steel erection shall not proceed without concrete in footings attaining 75% of the intended minimum compressive design strength. Documentation must be provided indicating compliance with this requirement.

B. Bracing and Protection:

1. Steel shall be well plumbed, leveled and braced to prevent any movement.
   a. Contractor shall provide and maintain all necessary temporary guying of steel frame to resist safely all wind and construction loads during erection and to assure proper alignment of all parts of the steel frame.

2. Provide all temporary flooring, bracing, shoring and guards necessary to prevent damage or injury. All partially erected steel shall be secured in an approved manner during interruptions of work.

C. Anchor and Foundation Rods:

1. All anchor or foundation rods and similar steel items to be built into concrete are to be set by the concrete contractors and shall be furnished promptly so that they may be built in as the work progresses because cutting of structural steel members to accommodate errors pertaining to embedded items will not be permitted.

3.2 FIELD WELDING

A. Welding Procedures:

1. All field welding shall be in accordance with AISC Specifications and conform to AWS D1.1 “Structural Welding Code - Steel”.


3.3 REPAIRS, PROTECTION, AND TOUCH UP

A. Repair damaged galvanized coatings and on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer’s written instructions.

3.4 GROUTING

A. Grouting under structural framing members shall be completed after all members have been plumbed and braced and before imposed loads are placed thereon.

B. Remove all defective concrete, dirt, oil, grease and other foreign matter from surfaces to which grout will be placed.

3.5 MISCELLANEOUS STEEL AND STEEL LINTELS

A. Furnish and install all miscellaneous steel as detailed in Architectural and Structural Drawings.

B. Provide additional steel framing for continuous support of steel deck edges at openings and column interruptions.

C. All exterior exposed steel shall be hot-dip galvanized in accordance with ASTM A123 painted in accordance with Division 9 after fabrication.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wall mounted handrails.
   B. Free-standing railings at steps and ramps.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
   B. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.
   C. Section 09 91 23 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS
   A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
   B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.
   C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.
   D. Allow for expansion and contraction of members and building movement without damage to connections or members.
   E. Dimensions: See drawings for configurations and heights.
      1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
   F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
      1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
      2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
   G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
2.02 STEEL RAILING SYSTEM
   A. Steel Pipe: ASTM A53/A53M, Grade B Schedule 80, black finish.
   B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
   C. Exposed Fasteners: No exposed bolts or screws.
   D. Straight Splice Connectors: Steel concealed spigots.
   E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION
   A. Accurately form components to suit specific project conditions and for proper connection to building structure.
   B. Fit and shop assemble components in largest practical sizes for delivery to site.
   C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
   D. Welded Joints:
      1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
      2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
      3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
   A. Clean and strip primed steel items to bare metal where site welding is required.
   B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
   C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
   D. Anchor railings securely to structure.
   E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Structural dimension lumber framing.
B. Subflooring.
C. Roof-mounted curbs.
D. Roofing nailers.
E. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS
A. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
B. Section 03 54 00 - Cast Underlayment.
C. Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.

1.03 REFERENCE STANDARDS
A. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; American Forest and Paper Association; 2012.

1.04 SUBMITTALS
A. See Section 01 33 23 - Shop Drawings, Product Data and Samples for submittal procedure
B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING
A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry or MC19.
C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.
2.03 CONSTRUCTION PANELS
   A. Subfloor/Underlayment Combination: Any PS 2 type, rated Single Floor.
      3. Performance Category: 1-1/8 PERF CAT.
      4. Edges: Tongue and groove.
   B. Underlayment: APA Underlayment; plywood, Exterior exposure class, 1/2 inch thick. Fully sanded faces at resilient flooring.

2.04 ACCESSORIES
   A. Fasteners and Anchors:
      2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   B. Subfloor Glue: APA AFG-01, Waterproof, water base, air cure type, cartridge dispensed.

PART 3 EXECUTION
3.01 PREPARATION
   A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
   A. Select material sizes to minimize waste.
   B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.03 FRAMING INSTALLATION
   A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
   B. Install structural members full length without splices unless otherwise specifically detailed.
   C. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

3.04 ROOF-RELATED CARPENTRY
   A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
   B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS
   A. Underlayment: Secure to subflooring with nails and glue.
      1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
      2. Place building paper between floor underlayment and subflooring.

3.06 TOLERANCES
   A. Framing Members: 1/4 inch from true position, maximum.
   B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
   C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING
   A. Waste Disposal: Comply with the requirements of Section 01 74 19.
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Sealants and joint backing.
   B. Precompressed foam sealers.

1.02 RELATED REQUIREMENTS
   A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the work with other sections referencing this section.

1.05 SUBMITTALS
   A. See Section 01 33 23 - Shop Drawings. Product Data and Samples for Submittal Procedures.
   B. Product Data: Provide data indicating sealant chemical characteristics.
   C. Manufacturer's Installation Instructions: Indicate special procedures.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
   B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

1.07 FIELD CONDITIONS
   A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.08 WARRANTY
   A. Correct defective work within a five year period after Date of Substantial Completion.
   B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Gunnable and Pourable Sealants:
      7. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Preformed Compressible Foam Sealers:
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SEALANTS
A. Sealants and Primers - General: Provide products having volatile organic compound (VOC) content as specified in Section 01 61 16.
B. Type I-1 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
   1. Color: Match adjacent finished surfaces.
   2. Applications: Use for:
      a. Other interior joints for which no other type of sealant is indicated.
   1. Products:
      a. Pecora Corporation; NR
         201 Self
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES
A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that substrate surfaces are ready to receive work.
B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION
A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean and prime joints in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION
A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
D. Install bond breaker where joint backing is not used.
E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
G. Tool joints concave.

3.04 CLEANING
A. Clean adjacent soiled surfaces.
3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Section includes interior renovation plaster work as indicated on the Drawings and specified herein. Such work includes, but is not necessarily limited to, the following:
   1. Repair and patch all existing plaster work removed for structural modifications and piping work.
   2. Match all existing flat work so patch is not visible.

1.02 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Where existing plaster ceilings and partitions are fire-resistance rated construction, Furnish materials and installations to maintain the fire rating using applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.

1.03 SUBMITTALS

A. Product Data: Submit product data consisting of manufacturer’s product specifications and installation instructions for each product, including data showing compliance with the requirements.

B. Mock-Up: Prepare a sample to demonstrate workmanship. Obtain Architect’s acceptance of mock-up before installation of renovation plaster.

1.04 QUALITY ASSURANCE

A. Plaster work shall be completed by a firms, specializing in plaster or plaster renovation, with not less than 5 years’ experience with work similar to work required in this project.

1.05 DELIVERY

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.

1.06 PROJECT CONDITIONS

A. Environmental Requirements: Comply with requirements of plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after application of plaster.

B. Ventilation: Ventilate building spaces as required to remove water in excess of that required for hydration of plaster. Begin ventilation immediately after plaster is applied and continue until it sets.

C. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects that might result from plastering.

PART 2 PRODUCTS

2.01 METAL MATERIALS

A. Wire for Ties: ASTM A 641, Class 1 zinc coating, soft temper.


C. Expanded Diamond Mesh Metal Lath: Fabricate flat expanded metal lath from zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847; weight of 3.4 lbs. per sq. yd.

D. Lath Attachment Devices: Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.
2.02 PLASTER MATERIALS

A. Base Coat Plasters: Complying with ASTM C 28, select base coat plaster to match existing conditions from one of the following:
   1. Gypsum ready-mixed plaster with mill-mixed perlite aggregate.
   2. Gypsum neat plaster.

B. Base Coat Plaster for thicknesses of 1/4” use high-strength gypsum neat plaster with a minimum, average, dry compressive strength of 2800 psi per ASTM C 472 for a mix of 100 lb of plaster and 2 cu. ft. of sand.

C. Finish Coat Plasters for Flat Plaster: Gypsum plaster complying with ASTM C 28; select plaster to match existing conditions from one of the following:
   2. Gypsum ready-mixed finish plaster, manufacturer’s standard mill-mixed gauged interior finish.

D. Finish Coat Plasters for Flat Plaster: Gypsum plaster complying with ASTM C 28; select plaster for any interior finish.

E. Aggregates for Base Coat Plasters: Sand aggregate complying with ASTM C 35.

F. Aggregates for Flat Finish Coat Plaster with Floated Finish: Sand aggregate, ASTM C 35; graded per ASTM C 842.

G. Water for Mixing and Finishing Plaster: Drinkable and free of substances capable of affecting plaster set or damaging plaster, lath, or accessories.

2.03 GYPSUM PLASTER FOR EXISTING FLAT PLASTER WORK

A. Gypsum Lath: ASTM C 37, type and thicknesses as indicated below, in length standard with manufacturer for thickness indicated.
   1. Type: Plain, unless otherwise indicated.
   2. Thickness: As indicated, or if not otherwise indicated, as required to comply with ASTM C 841 for type of installation and support spacing furnished.

B. Lath Attachment Devices: Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.

C. Metal Corner Beads: Type fabricated from zinc-coated (galvanized) steel.

D. Base Coat Compositions over Gypsum Lath: Comply with ASTM C 842 and manufacturer’s directions for gypsum plaster base coat proportions for two-coat work over gypsum lath.

E. Finish Coats: Proportion materials for finish coats to comply with ASTM C 842 for finish coat with troweled finish. Proportion materials in parts by dry weight for finish coats to comply with the following requirements.
   1. Troweled Finishes: 1 part gypsum gauging plaster, 2 parts lime

PART 3 EXECUTION

3.01 LATHING AND FURRING, GENERAL

A. Interior Lathing and Furring Installation Standard: Install lathing and furring materials indicated for gypsum plaster to comply with ASTM C 841.

B. Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated.

C. Install expanded metal lath or wire metal lath; match existing conditions.

3.02 PLASTER APPLICATION, GENERAL

A. Interior Gypsum Plaster Application Standard: Apply gypsum plaster materials, composition, mixes, and finishes indicated to comply with ASTM C 842.
B. Ornamental Plaster Renovation: Execute ornamental plaster by replicating existing plaster detailing.
   1. Run cornices, coves, and moldings full, straight and true with molding plaster, using metal template conforming to the profiles required to replicate existing details.
   2. Cast ornamental plaster work which cannot be run in place.

C. Prepare monolithic surfaces for bonded base coats and use bonding compound or agent to comply with requirements of referenced plaster application standards for conditioning of monolithic surfaces.
   1. Tolerances: Do not deviate more than 1/8 inch in 10’ from a true plane in finished plaster surfaces, as measured by a 10’ straightedge placed at any location on surface.
   2. Thickness and Number of Coats: Use three-coat work applied at thickness required by referenced standards.
   3. Finish Coats: Troweled finish; match existing adjacent plaster.

D. Sequence plaster application with the installation and protection of other work so that neither will be damaged by the installation of the other.

3.03 FLAT PLASTER PATCHING
   A. Outline the damaged portion of plaster and cut along outline, using a sharp saw. Complete cut through the plaster and lath. Remove existing damaged plaster.
   B. Cover the entire removed area with new wire or expanded metal lath; select lath to match existing conditions. Lath shall be cut slightly smaller than area to be patched, and nailed or wire tied to supports.
   C. Prior to plastering, wet the adjacent existing plaster, and if the supports are wood, wet the wood supports.
   D. Apply the plaster materials indicated to comply with ASTM C 842.

3.04 PLASTER SURFACE PATCHING AND REPAIR
   A. Patch, point up, and repair plaster as necessary to accommodate installation of other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to the substrate has failed.
      1. On completion of work, patch so that, after painting, patch will not be visible.
      2. Feather final plaster coat adequately to insure a smooth finish with adjacent surfaces.
   B. Sand smooth-troweled finishes lightly to remove trowel marks and arises.

3.05 CLEANING
   A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered. Repair floors, walls, and other surfaces that have been stained, marred, or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers, and equipment and clean floors of plaster debris.
   B. Furnish final protection and maintain conditions, in a manner suitable to Installer that ensure plaster work's being without damage or deterioration at time of Substantial Completion.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
   1. Resilient tile and sheet.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency’s report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

F. Preparation of new and existing wood-based floors and subfloors for installation of new floor coverings.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.

B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.

C. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.

D. Section 03 54 00 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.03 REFERENCES


C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.


F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.04 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Adhesive Bond and Compatibility Test Report.
1.05 QUALITY ASSURANCE
   A. Contractor may perform adhesive and bond test with his own personnel or hire a testing agency.
   B. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years’ experience installing moisture emission coatings.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.
   B. Deliver materials in manufacturer’s packaging; include installation instructions.
   C. Keep materials from freezing.

1.07 FIELD CONDITIONS
   A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
   B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
      1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
      2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
   B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
   C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
      1. Thickness: As required for application and in accordance with manufacturer's installation instruction.
      2. If testing agency recommends any particular products, use one of those.
      3. Products:
         e. Substitutions: See Section 01 60 00 - Product Requirements.
PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Preliminary cleaning.
   3. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   4. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   6. Specified remediation, if required.
   7. Patching, smoothing, and leveling, as required.
   8. Other preparation specified.
   10. Protection.

B. Remediations:
    1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
    2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating over entire suspect floor area.
    3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.
D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient base.
B. Rubber stair treads and accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
B. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
B. ASTM D2240 Standard Test Method for Rubber Property - Durometer Hardness
C. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double-Head Abrader)
F. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
G. ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
H. ASTM F150 Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
I. ASTM F511 Standard Test Method for Quality of Cut (Joint Tightness) of Resilient Floor Tile
J. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
K. ASTM F970 Standard Test Method for Static Load Limit
L. ASTM F1344 Standard Specification for Rubber Floor Tile
M. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
N. ASTM F1859 Standard Specification for Rubber Sheet Floor Covering Without Backing
O. ASTM F1860 Standard Specification for Rubber Sheet Floor Covering With Backing
P. ASTM F1861 Standard Specification for Resilient Wall Base
Q. ASTM F2055 Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method
S. ASTM F2420 Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood
T. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
V. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.
B. Deliver materials sufficiently in advance of installation to condition materials to room temperature prior to installation.

1.06 QUALITY ASSURANCE
A. Manufacturer: Provide resilient flooring manufactured by a firm with a minimum of 10 years’ experience in the fabrication of resilient flooring of types equivalent to those specified. Manufacturers proposed for use, which are not named in this Section, shall submit evidence of ability to meet performance requirements specified not less than 10 days prior to bid date.
B. Color Matching: Provide resilient flooring products, including wall base and accessories, from one manufacturer to ensure color matching.
C. Manufacturer capable of providing field service representation.
D. Installer’s Qualifications: Installer experienced (minimum of 2 years) to perform work of this section who has specialized in the installation of the specified materials required for this project and who is certified in writing by the flooring manufacturer. Site crew shall also be certified and experienced in installation of the specified flooring material.
E. Materials: For each type of material required for the work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturer of the primary materials. Comply with applicable regulations regarding VOC (volatile organic compound) content of adhesives.

1.07 FIELD CONDITIONS
A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Maintain temperature and humidity at service levels or 68° F (20° C), ± 5° F (3° C), and 50% RH ± 10% in areas to receive resilient flooring and subfloor preparation. Specified temperature shall be maintained at least 48 hours before, during, and 72 hours after installation.

1.08 WARRANTY.
A. Refer to General Conditions for 2-year contractual warranty against defects in manufacturing and workmanship of resilient flooring system.
PART 2 PRODUCTS

2.01 STAIR COVERING

A. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness; nosing not less than 1-5/8 inch deep.
   1. Nominal Thickness: 0.1875 inch.
   3. Style: Contrasting color abrasive grit strips full width.
   4. Type: 1-smooth.
   5. Pattern: Discs.
   7. Manufacturers:
      d. Nora www.norarubber.com
      e. Substitutions: See Section 01 60 00 - Product Requirements.

   1. Material: Rubber
   2. Nominal Thickness: 0.125 at elevations and 0.0625 at depressions
   4. Color: As selected by Architect from manufacturer's full range of colors.
   5. Manufacturers:
      a. Same as stair treads

2.02 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Height: 4 inch. As indicated on the drawings.
   2. Thickness: 0.125 inch thick.
   4. Length: 4 foot sections.
   5. Color: Color as selected from manufacturer's standards.
   6. Accessories: Premolded external corners, internal corners, and end stops.
   7. Manufacturers:
      a. ______.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

A. Adhesives, and Seaming Materials: Install adhesive per manufacture's recommendations and installation guidelines.
   1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.

B. Moldings, Transition and Edge Strips: Rubber.

C. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

C. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. All subfloors shall be permanently dry, clean, smooth and structurally sound as per ASTM F710 — Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. Subfloors shall be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, film forming curing compounds, silicate penetrating curing compounds, sealers, hardening or parting compounds, alkaline scales, excessive carbonation or laitance, mold, mildew, old adhesives and other extraneous materials that may interfere with the bond. These shall be completely removed by mechanical means only. All local, state and federal regulation shall be followed.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

B. Remove sub-floor ridges and bumps. Fill voids, cracks, and depressions with trowel-applied leveling compounds acceptable to manufacturer. Remove projections and repair other defects to tolerances acceptable to manufacturer.

C. Do not install over moving saw cuts or cracks. Remove all saw laitance, dirt, debris, coatings, sealers, and visible moisture from the dormant saw cuts and cracks. Cracks and joints shall be filled per manufacturer's recommendations. For wide gaps use a thicker mixture, for deep joints a backer rod, a minimum of ½ inch down, may be used prior to filling.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install adhesive per manufacture's recommendations and installation guidelines.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly. Joints shall be flush.

E. Set flooring in place in accordance with manufacturer's recommendations to achieve full adhesion and to pattern indicated on the drawings.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Resilient Strips: Attach to substrate using adhesive.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

I. Layout resilient flooring to pattern indicated. Provide equal size at perimeter. Adjust layout as necessary to eliminate resilient flooring which is cut to less than half full width.

J. Extend resilient flooring and base into reveals, closets, and similar openings and under casework where casework does not extend to the floor.

K. Install reducer strips at exposed edges.

L. Do not mix manufacturing batches of a color within the same area.

M. Do not install defective or damaged resilient flooring

3.04 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.05 STAIR COVERINGS

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

3.07 PROTECTION

A. Prevent all traffic for a minimum of 12 hours and heavy rolling loads for 72 hours to allow the adhesive to set up. If required, after 12 hours protect the flooring from damage during construction operations using Masonite, plywood or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Rubber sheet flooring, adhesively installed.
   B. Accessories.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
   B. Section 03 54 00 - Cast Underlayment.
   C. Section 09 65 00 - Resilient Flooring.

1.03 REFERENCE STANDARDS
   C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
   D. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's printed data sheets for products specified.
   C. Shop Drawings: Fabrication and installation details, and seam layout.
   D. Selection Samples: Manufacturer's color charts for flooring materials specified and game line paints, indicating full range of colors and textures available.

1.05 QUALITY ASSURANCE
   A. Installer Qualifications: An experienced installer certified in writing by the flooring manufacturer to be qualified for installation of specified flooring system.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
   B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.07 FIELD CONDITIONS
   A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70-95 degrees F for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F or to go above 100 degrees F.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING
   A. Manufacturers:
      1. Basis of Design:
         a. Mondo, Indoor Sport; Sport Impact, Skate Resistant Rubber Flooring.
      2. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Rubber Sheet Flooring: Rubber sheet flooring comprised of a solid 3mm nonporous wear layer engineered to withstand heavy abuse from skate blades bonded to an impact layer.
1. VOC Content: Certified as Low Emission by one of the following:
2. Thickness: Minimum 1/4 in.
3. Sheet Width: Minimum 60 inches.
4. Tensile Strength: Minimum 300 psi, per ASTM D412.
6. Class 1 fire code rating.
7. Antibacterial and antimicrobial throughout
8. ADA compliant slip resistance.
9. Color: To be selected from manufacturer's full product line.

2.02 ACCESSORIES
   A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.
   B. Flooring Adhesive: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.
   B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.
   C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
      1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION
   A. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius.
   B. Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.
   C. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION
   A. Starting installation constitutes acceptance of sub-floor conditions.
   B. Comply with manufacturer's recommendations and approved shop drawings.
   C. Resilient Sheet Flooring:
      1. Unroll flooring and allow to relax before beginning installation.
      2. Mix adhesive thoroughly and apply to substrate with notched trowel. Roll flooring into fresh adhesive, overlapping end seams and double cutting, butting factory edges and compression fitting.
      3. Roll entire flooring surface with steel roller to assure adhesion to substrate and eliminate air bubbles.
      4. Immediately remove any adhesive from flooring surface, using chemical recommended by flooring manufacturer.
      5. Weld seams using techniques and equipment recommended by manufacturer.
      6. Lay out game lines using tape and taping machine approved by flooring manufacturer.
         Apply game line paint with roller, and allow to dry before removing tape.
      7. Apply transparent top coat over flooring if recommended by manufacturer, to achieve a uniform finished appearance.
3.04 CLEANING
   A. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION
   A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

END OF SECTION
PART I - GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints.
C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically so indicated.
   7. Concealed pipes, ducts, and conduits.

1.02 RELATED DRAWINGS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 78 23 – Operation and Maintenance Data

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

C. GreenSeal GS-11 - Paints; 1993.

1.05 SUBMITTALS

A. See Section 01 33 23 - Shop Drawings, Product Data, and Samples for submittal procedures.
B. Submittals for all paints and coatings and associated colors shall be provided to Owner for approval prior to application.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified
   1. Where sheen is specified, submit samples in only that sheen
D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
F. Manufacturer's Instructions: Indicate special surface preparation procedures.

1.06 MAINTENANCE MATERIALS

A. The installing Contractor shall supply to the Owner an extra 1 gallon of each paint product used for future touch-up purposes. All paint materials and colors shall be clearly identified.
B. At the completion of the project, a schedule listing each space with manufacturer, product, color, and sheen shall be provided as part of the O&M manual. Colors shall not be identified by name (such as Midnight Blue) but shall be identified by formula.
1.07 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
   B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
   C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS
   A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
   C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 WARRANTY
   A. Interior Paints and Coatings: Shall be warranted for 7 to 10 years.

PART 2 - PRODUCTS
2.01 PAINTS AND COATINGS
   A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
   B. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
      1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
      2. All paints and coatings shall be architectural grade as opposed to contractor grade.
      3. Supply each coating material in quantity required to complete entire project's work from a single production run.
      4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
   C. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
   D. Volatile Organic Compound (VOC) Content:
      1. Provide coatings that comply with the most stringent requirements specified in the following:
   E. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
   F. Flammability: Comply with applicable code for surface burning characteristics.
   G. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
   H. Colors: To be selected from manufacturer's full range of available colors.
      1. Selection to be made by Architect after award of contract.
      2. Allow for a minimum of 2 colors for each surface to be finished.
         a. Drywall/ Plaster.
b. Hollow Metal Frames.

2.02 APPROVED MANUFACTURERS
   A. Pratt & Lambert
   B. Sherwin-Williams (ProMar 200 Zero VOC Interior Latex)
   C. MAB
   D. Pittsburgh
   E. Benjamin Moore

PART 3 - EXECUTION

3.01 INSTALLERS
   A. Engage an experienced Contractor who has completed paint or coating applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance. Experienced craftsmen shall apply all paints and coatings.

3.02 HEALTH AND SAFETY
   A. Physical Barrier: A continuous physical barrier shall be maintained between work areas and occupied/populated areas, especially indoors.
   B. Fresh Air: Fresh air shall be provided in appropriate quantities and temperatures while painting within University buildings.
   C. Protect from Fumes: Appropriate steps shall be taken to protect all personnel, especially building occupants and/or pedestrians, from dust and/or fumes that are potentially harmful.
   D. Lead Paint: When existing lead paint is encountered it shall be addressed in compliance with the requirements of the Safety and Compliance section within the General Requirements of the U of I Facilities Standards.

3.03 SURFACES TO REMAIN UNPAINTED
   A. Do Not Paint: Below is a partial listing of the most frequent violations.
      1. Moving/movable equipment parts
      2. Flexible ventilation duct connections
      3. Flexible hose / pipe connectors
      4. Stainless steel components
      5. Galvanized steel surfaces/components (unless special surface preparation is accomplished prior to painting to ensure long term bonding).
      7. Equipment performance/rating information labels
      8. Code required / code identification labels

3.04 INTERIOR SURFACES
   A. New and Existing Metal Handrails: Shall be spray or brush applied, not roller applied. Existing rails shall be scraped and sanded smooth before applying new paint finish.
   B. Equipment, Piping and Supports:
      1. Prime and Paint: All unfinished equipment, piping, and supports shall receive one coat of a solvent-based rust-check oil primer followed by a finish coat of Owner approved paint.
      2. Labels: All piping shall be color coded and/or labeled as specified.
   C. Previously Painted Walls and Ceilings:
      1. Holes: All holes and cracks shall be patched flush with surrounding wall surface.
      2. Prime and Paint: All surfaces shall receive one coat of primer-sealer and one coat of eggshell or low luster enamel.
PART 4 - SUBMITTALS

4.01 SCHEDULES

A. Refer to Finish Plans

B. Ensure schedules are submitted which will enable the replication or reorder of any manufactured product per Section 01 78 23 – Operation and Maintenance Data

END OF SECTION
PART 1 - GENERAL

1.1 GENERAL

A. The ice systems contractor shall provide labor and materials for a fully operating complete ice rink and system including, but not limited to, the ice refrigeration package, the roll out rink floor matting system, the dasherboards and all electrical power and controls.

1.2 RELATED DOCUMENTS

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

B. All ice system Division 13 sections, and related are to be grouped.

1.3 QUALIFICATIONS

A. Refrigeration installer shall be pre-approved and have installed a minimum of six (6) artificial ice rinks to be eligible to submit a bid on this work.

B. The refrigeration installer shall have sufficient qualified personnel available at time of installation and applicable and sufficient equipment to perform the installation work.

C. The refrigeration installer shall provide service for the equipment after installation.

D. The refrigeration installer shall be subject to the Prevailing Wage laws of the State of Illinois.

E. The refrigeration installer must be experienced in the assembly of ice plants from component parts as shown on the plans. Refrigeration installer shall submit the names and contact information for at least six (6) rinks where they have assembled successful ice systems in the last five (5) years.

1.4 REFERENCES

A. ACI: American Concrete Institute
B. AGA: American Gas Association
C. ANSI: American National Standards Institute
D. ARI: American Refrigeration Institute
E. ASHRAE: American Society of Heating Refrigeration and Air Conditioning Engineers.
F. ASME: American Society for Mechanical Engineers
G. ASTM: American Society for Testing and Materials
I. IIAR: International Institute of Ammonia Refrigeration
J. MSS: Manufacturer's Standardization Society of the Valve and Fitting Industry
K. NEMA: National Electrical Manufacturers Association

1. NFPA: National Fire Protection Association
2. UL: Underwriters Laboratories, Inc.

1.5 RELATED WORK

A. Division 01: Shop Drawings, Product Data, and Samples
B. Division 01: Storage and Protection
C. Division 01: Product Options and Substitutions
D. Division 01: Project Record Documents
E. Division 03: Concrete
F. Division 06: Rough Carpentry (Wood blocking in walls required for attaching mechanical items.)
G. Division 07: Flashing and Sheet Metal (Flashing for mechanical items penetrating walls and roof.)
H. Division 09: Painting (Painting of pipe).
I. Division 23: HVAC
J. Division 26: Electrical.
K. Division 33: Utilities Excavating and Backfilling.

1.6 SUBMITTALS

A. Submit under provisions of Division 01.

B. Include Products as specified in the individual sections of Division 13.

C. Submit shop drawing and product data, eight (8) hard copies and one (1) electronic copy, grouped to include complete submittals of related systems, products, and accessories in a single submittal.

D. Submit eight (8) hard copies of parts, operations, and maintenance manuals on major pieces of equipment.

E. Submit copies of shop drawings as per Division 01, including:
   1. Concrete pads and foundations including anchor bolt and sleeve locations.
   2. Layouts for ice system equipment rooms, including:
      a. Room dimensions
      b. Support column locations
      c. Locations and dimensions of equipment foundations and pads required
      d. Locations and dimension of equipment and apparatus, including electrical control panels and starters, and service and coil pull areas.
      e. Locations of wall mounted equipment
      f. Trench locations and sizes
      g. Sleeve locations in equipment rooms

F. Brochures: Submit manufacturer’s product data and brochures including:
   1. Complete descriptions
   2. Illustrations
   3. Rating data, accessories, dimensional data, and features as scheduled on drawings and specified herein.
   4. Capacities stated in the terms specified
   5. Performance curves for all pumps

1.7 REGULATORY REQUIREMENTS

C. ANSI Handicapped Code-A117.1
D. 2009 Pennsylvania State Building Code
E. 2009 International Building Codes
1.8 PROJECT/SITE CONDITIONS

A. Ice rink system layout indicated on drawings is specific and shall be adhered to as drawn. Coordinate ice system work with other trades prior to installation. Install work in locations shown on drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other sections, if jobsite conditions prevent installation as shown. Obtain permission of Engineer before proceeding.

C. Place anchors, sleeves, and supports prior to pouring concrete or installation of masonry work.

D. Cause as little interference or interruption of existing utilities and services as possible. Schedule work that will cause interference or interruption in advance with Owner, authorities having jurisdiction, and all affected trades.

E. Determine sizes and verify locations of existing utilities on or near site.

F. Keep roads and mechanical spaces clear of materials and debris.

G. Visit site and be informed of conditions under which Work must be performed.

1.9 COORDINATION DRAWINGS

A. Prepare and submit coordination drawings for work under this Division, as specified in Division 01, in full cooperation with persons performing work under other Divisions.

B. Coordination Drawings shall prepared to include the following:

1. Drawn to a scale of 1/4" = 1'-0"
2. Room dimensions
3. Sheet size matching contract documents
4. Pipe sizes with bottom elevation from finished floor
5. Show lighting, equipment, piping, columns, and beams with mounting heights
6. Concrete pad and foundation layouts including anchor bolt and sleeve locations
7. Dimensioned floor drain locations
8. Wall mounted equipment.

1.10 REFERENCE STANDARDS AND DEFINITIONS

A. Comply with provisions of Division 01.

1.11 PRODUCT SUBSTITUTIONS

A. Comply with provisions of Division 01.

1.12 RECORD DRAWINGS

A. Provide record drawings that illustrate the work of Division 13 sections as finally constructed. Deliver record drawings to the Engineer in a form suitable for reproduction.

B. Record drawings shall reflect all changes made to the Contract Documents, whether generated by addenda, change orders, or field conditions. Maintain a daily record of these changes and keep current set of drawings showing these changes.
C. Deliver record drawings to Engineer within 30 days of Substantial Completion.

1.13 **OWNING AND OPERATING MANUALS**

A. Comply with the requirements of Division 01.

B. Manuals shall include clear and comprehensive instructions with appropriate graphics to enable owner to operate and maintain all systems specified herein.

**PART 2 - PRODUCTS**

2.1 **EQUIPMENT SUPPORTS**

A. Structural steel for supports: ASTM A36
   1. Use galvanized members installed in areas of high humidity or condensation, and outside.
      a. Furnish other members with shop coat of red lead primer.
   2. Retouch primer after field welding.

2.2 **FLASHINGS AND COUNTERFLASHINGS**

A. Furnish materials and coordinate installation for flashing and counterflashing roof and wall penetrations for vents, pipe, drains, and ducts.

B. Materials:
   1. Sheetmetal: 24 gauge minimum ASTM A525, Class G90
   2. Sheet lead: 6 pounds per square foot
   3. Stainless steel: Minimum 20 gauge
   4. Sheet copper: 24 OZ/SF
   5. Vent Stack Fitting: Josam 1830 or Jay R. Smith 1750

2.3 **NAMEPLATES AND TAGS**

A. Acceptable manufacturers: Seton Nameplate Corporation

B. Rigid plastic, "Setonite" or bakelite with engraved lettering, minimum 1/2" high

C. Provide brass valve tags, at least 1-1/2 inch in diameter, with alpha numeric ID. Tag shall have permanently stamped black filled letters showing service and black filled number showing valve or equipment number. At substantial completion, a schedule of all valves shall be submitted to the Architect and owner.

2.4 **SLEEVES**

A. Provide sleeves for all piping installed under this Division as specified.

2.5 **ELECTRIC MOTORS**

A. Submit all motor information with submittals and shop drawings for ice system equipment.
2.6 ICE SYSTEM INSULATION
   A. Provide insulation for ice systems piping as specified per Section 13 18 13.
   B. Ice rink refrigeration package to be insulated from manufacturer. Insulation to include all piping, pumps, chillers, compressors, and heat exchangers.

PART 3 - EXECUTION

3.1 EXCAVATING AND BACKFILLING
   A. Provide trenching, excavating, and backfilling necessary for performance of work indicated in Contract Documents. Coordinate requirements with provisions of Division 02.

3.2 CUTTING AND PATCHING
   A. Repair or replace damage caused by cutting or installation of work specified in Division 13 sections.
   B. Perform repairs with materials, which match existing and install in accordance with the appropriate section of these specifications.

3.3 FLASHING AND COUNTERFLASHING
   A. Counterflash ducts and pipes where penetration of roofs and outside walls occurs.

3.4 DELIVERY, STORAGE, AND PROTECTION
   A. Insofar as possible, deliver items in manufacturer's original unopened packaging. Where delivery in original packaging is not practical, provide cover and shielding for all items with protective materials to keep them from being damaged. Use care in loading, transporting, unloading, and storing to keep items from being damaged.
   B. Store items in a clean, dry place, and protect from damage.
   C. Protect nameplates on motors, pumps, and similar equipment. Do not paint or insulate over nameplate data.
   D. Keep dirt and debris out of pipes.
   E. Repair, restore, and replace damaged items.
   F. Cover factory finished equipment during work of finished trades, such as pumps.

3.5 PIPE IDENTIFICATION
   A. Pipe Identification:
      1. Identify piping by tagging (to denote contents and direction of flow) piping at no more than 25 foot intervals at valves, and at least once in each separate space through which the pipe passes.
      2. Tagging script shall be a minimum of 2" high letters.
3.6 PIPE, EQUIPMENT, ROOM AND APPARATUS IDENTIFICATION

A. Acceptable Manufacturers: Seton Name Plate Corporation or equal

B. Nameplates: Rigid plastic, "Setonite" or bakelite, with engraved lettering (indicating names and numbers of mechanical apparatus), a minimum of 1/2" high. Fill engraved lettering with a permanent coloring material, which contrasts with color of tag material to allow for easy reading.

C. Pipe Labels: Seton "Setmark" type snap-on full encirclement type markers for fluids, with "Opti-Code" ammonia pipe markers on ammonia piping, in "Setmark" system.

D. Use names, numbers, and abbreviations appearing in schedules on Contract Drawings.

E. Provide nameplates, located in a conspicuous location directly on the equipment or apparatus, for ice system equipment including, but not limited to:
   1. Starters
   2. Ice Chiller Plate and Frame Exchangers
   3. Pumps
   4. Compressors
   5. Liquid Receiver

F. Nametag Fasteners: Commercial quality, rust resisting nuts and bolts with backwashers, self tapping screws, or rivets. If equipment surface does not allow for direct attachment, use copper or brass rings to attach tags.

G. VALVE TAGS
   1. Each manual and automatic control valve shall be identified with a brass tag. The tag shall contain an alphanumeric I.D. which shall be unique and separate/different from the house HVAC and plumbing systems.
   2. A valve schedule shall be provided to Engineer and Owner. Mount valve schedule under glass and mount as directed by Owner.
   3. Securely fasten tags to valves with a brass "S" hook or chain.

3.7 CLEANING MECHANICAL SYSTEMS

A. General Cleanup:
   1. Upon completion of contract and progressively as work proceeds, clean up dirt, debris, oil materials, etc., and remove from site, keeping premises in neat and clean condition to satisfaction of the Architect.
   2. Seepage, discoloration or other damage to parts of the building, its finish, or furnishings due to Contractor's failure to properly clean piping systems or duct systems shall be repaired without cost to the Owner.

B. Factory Finishes:
   1. Clean items with factory finishes. Touch up bare places, scratches and other minor damage to finishes. Use only factory-supplied paint of matching color and formula. If finishes are badly damaged or if there are many damaged, scratched or bare places, refinish the entire item.
C. Ice Rink System Commissioning:

1. Secondary Refrigerant Circuit Initial flushing:
   a. The permanent facility pumps may be used. Leakage from pump seals or other damage resulting from circulating unclean water or system debris shall require immediate rectification at no additional cost to the Owner.
   b. Fill entire system with clean water to normal charge. Start first circulation pump and run for a minimum of four hours, shut off first circulation pump, isolate and remove start up screen. Run second circulation pump for four hours, isolate and remove start up screen. Remove all water from system flush with air pressure until all possible water has been removed prior charging system with secondary coolant.

3.8 TESTING ICE SYSTEMS

A. Test all systems and equipment installed to demonstrate proper operation.

B. Advise Engineer of scheduled systems testing and completed system demonstration/operation schedules so that he may witness, if desired.

C. Correct and retest work found defective when tested.

D. Make repairs to piping systems with new materials. Peening, doping, or caulking of joints or holes will not be acceptable.

E. Steel Ice System and Ice Matt Glycol Piping: Air pressure test piping at 60 psig pressure for a period of six hours without evidence of leaking.

F. R407 Testing:
   1. High Side Testing – R407 to 225 psi, dry nitrogen
   2. Low Side Testing – R407 to 220 psi, dry nitrogen

G. Evacuation: Isolate sections of refrigeration system for evacuation. Install vacuum pump and evacuate system to below 700 microns. Break vacuum with dry nitrogen to a positive pressure and conduct second evacuation again to below 700 microns. Isolate vacuum pump from system and hold test to below 700 microns for 1 hour. If test does not hold, continue running pump until test passes on all components and piping of the refrigeration system prior charging system with R717.

H. Testing Reports: Submit reports for the above testing and evacuation. Test and evacuation reports should include the specific portion of the system being testing, the date of the test, and duration of the test and then be signed and witnessed for each test and evacuation.

3.9 SYSTEM STARTUP

A. After evacuation of the primary refrigerant side of the system provide a complete operating charge of R407A. Provide an additional 60# of refrigerant in canisters on site for any immediate loss of charge during the warranty period. The contractor shall be responsible for all loss of refrigerant from the refrigeration package during the warranty period and provide service to repair any leaks.

B. After testing completion and system inspection by the engineer the system shall be charged with inhibited ethylene glycol to a concentration of 40% glycol and 60% water. The air shall be removed from the system and monitored by the contractor for the next 4 months after system
startup. All air to be removed by the contractor during this period and any required addition of glycol to be by the contractor as air is removed.

C. Provide final glycol sample to testing agency, obtain written report and submit with final documents.

D. Provide a certified factory trained technician to perform the refrigeration package start up, for a minimum of 3 consecutive days.

E. Provide a minimum of 4 days on site to train owner’s staff on the system operation and assist in the first ice making.

F. Review operation and maintenance manuals with owner’s staff.

3.10 WORK INCLUDED

A. Ice system contractor shall provide all materials and perform the work required for a complete operable ice rink refrigeration system for a rink that is 192’ x 100’ including but not limited to the following:

1. Remove the existing dasherboard system as currently installed. Dasherboard players and penalty boxes to remain if option for new is not accepted.

2. Existing rink netting to be removed or raised to allow installation of new ice rink system. New rink floor to be 15’ narrower than the existing and final netting installation to reflect new layout of 100’ wide.

3. Remove and dispose of existing calcium chloride charge in rink floor, the mechanical room, and all interconnecting piping. Provide documentation that charge was taken to proper disposal facility.

4. Demolish as required and as shown on the drawings, the existing rink slab to allow the installation of the new matt system headers and transmission piping from the piping tunnel alongside of the rink, and to allow the installation of the new curbing for dasherboard supports.

5. Demolish as required and as shown on the drawings, the existing distribution manifolds located in the tunnel alongside the rink.

6. Core drill through tunnel wall to demolished rink slab to allow installation of rink transmission piping.

7. Remove concrete floor in the ice resurfacer room as shown on the drawings, excavate and core drill subsurface wall as required to allow installation of rink transmission piping from the ice resurfacer room to the tunnel for installation of transmission piping.

8. Furnish and install structural steel supports for the support of the new refrigeration package as shown on the drawings.

9. Furnish and install the outdoor refrigeration package as specified with all heat exchangers, compressors, motors, air cooled condenser, pumps, piping, insulation and controls. Package to be located on the roof as shown on the drawings.

10. Furnish and install horizontal expansion tank at the highest point in the system for air removal.

11. Furnish and install transmission piping from the refrigeration package on the roof to the rink floor matt system as shown on the drawings.

12. Furnish and install new curbing alongside rink as shown on the drawings to support dasherboard system. Curb to contain reinforcing steel, be doweled into existing slabs as shown and provide sleeves for connections from matt headers to matt sub-headers.

13. Furnish and install rink floor matt system as specified and as shown on the drawings. Matt shall be continuous throughout rink floor to maintain quality ice over the entire ice sheet and especially at rink edges and radius. Matt to have anchoring cable around the rink as required maintaining spacing and coverage after matt is chilled to ice making temperature.
14. Furnish and install new dasherboard system around the rink as specified and as shown on the drawings, including reinstallation of netting above dasherboards.
15. Provide all testing of system as specified.
16. Provide all required electrical feeds from electrical room to the refrigeration package and all package electrical starters, disconnects and controls as specified.
17. Furnish and install all primary and secondary refrigerant charges for the ice system.
18. Insulate all transmission piping and rink matt headers as indicated on drawings and specified.
19. Provide two year warrant as specified.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK INCLUDED

A. The contractor is to supply and install a fully functioning and operating ice rink refrigeration system as drawn and specified in Division 13. This includes, but not limited to, all piping, equipment, controls, rink floor and rink floor insulation as shown and specified.

B. Refer to drawings for system materials and component schedule in addition to the specification sections for Division 13.

C. Contractor to provide and install a complete operating charge on inhibited ethylene glycol with a concentration of no less than 40% by volume to water. Contractor to install glycol charge after cleaning and flushing system as outlined in Division 13.

D. Contractor to provide and install a full primary refrigerant operating charge for the system, for use on all conditions. Contractor to install primary and secondary refrigerants after testing and evacuation as outlined in Division 13.

E. Extent of mechanical insulation required by this Section is indicated on drawings and by the requirements of this Section.

F. This extruded polystyrene specification applies to the piping and equipment surfaces that are in contact with the glycol system that supplies ultra-low (14° to 30° F) fluid to the ice slab.

G. This fiberglass specification applies to all other metal surfaces that normally operate at 30° F and above.

H. This flexible unicellular specification applies to all irregularly shaped surfaces that cannot be neatly covered with fiberglass pipe covering or rigid board.

I. Types of mechanical insulation specified in this Section include the following:

1. Piping System Insulation
   a. Extruded Polystyrene (Styrofoam)
   b. Fiberglass

2. Equipment Insulation
   a. Extruded Polystyrene
   b. Fiberglass
   c. Flexible Unicellular

J. Refer to Division-23 Section "Hangers and Supports for HVAC Piping" and details on mechanical drawings for protection saddles and protection shields. Only protection shields as shown on the detail sheets are work of this Section.
1. Note that hangers are to be placed on the outside of all insulated services. Hangers cannot touch pipe surfaces served.

K. Provide "Pipe Identification" for installation of identification devices for piping and equipment that is work of this Section.

1.3 QUALITY ASSURANCE

A. Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

B. Flame/Smoke Ratings: Provide composite mechanical insulation systems (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E84 (NFPA 255) method.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, k-value, thickness, density in lbs./cu. ft., and furnished accessories for each mechanical system requiring insulation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard indexes of products.

B. Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation, or insulation that has been previously wetted and dried out; remove from project site.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS OF EXTRUDED POLYSTYRENE

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products, which may be incorporated in the work, include the following:

1. Illinois Tool Works Insulation Systems
2. Keller Products, Inc.
3. Special Service Plastics Co., Inc.
4. Duna Corporation

2.2 PIPING INSULATION MATERIALS FOR POLYSTYRENE

A. Insulation: ASTM C591; Rigid Pre-Molded Polystyrene Foam

1. 'K' Value: ASTM C518; 0.259 at 75° F
2. Minimum Service Temperature: -297° F
3. Maximum Service Temperature: 165° F
4. Maximum Moisture Absorption: ASTM C-272; .5 percent pipe by volume
5. Maximum Flame Spread: ASTM E84; 5
6. Maximum Smoke Developed: ASTM E84; 165.
B. Jackets for Polystyrene Piping Insulation: Two covering layers shall be applied to all insulated surfaces. The layer immediately over the insulation shall be one ply of 6 mil SARAN™ 560 Vapor Retarder film with permeance of 0.01, flame spread 5, smoke developed 25. The outer layer must be white ASJ with 25/50 FS/SD rating.

1. Can be applied to the insulation to arrive on site in 3’ section clamshell type.
2. Moisture Vapor Transmission of Assemblies: ASTM E96; 0.00 – 0.01 perm inches
5. Assembly meets ASTM E84 25/50 smoke and flame requirements.
6. High Puncture and tear resistance
7. Affords zero permeability
8. No special tools required for installation

C. Ultra-low Temperature Fitting Covering: All elbows, tees, and other required/shown fittings, offsets, or changes in direction shall be covered with mitered or factory pre-molded polystyrene insulation material so that the insulation system is homogeneous throughout. If fitting insulation is field mitered, apply two layers of SARAN™ 560 vapor barrier before application of fitting covers.

D. Jacketing Material for Ultra-low Temperature Fittings: Normally use factory pre-shaped Polyguard coverings on polystyrene fittings. LoSMOKE® fitting covers by Proto are also acceptable.

2.3 ACCEPTABLE MANUFACTURERS OF FIBERGLASS AND ELASTOMERIC

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products, which may be incorporated in the work, include the following:

1. CertainTeed Corp.
2. Knauf Insulation GmbH
3. Owens Corning Corp.
4. Johns Manville Corp.
5. Aerocel USA, Inc.
6. Armacel Enterprise GmbH
7. Armaflex

2.4 PIPING INSULATION MATERIALS FOR FIBERGLASS AND ELASTOMERIC - TYPE I – VAPOR BARRIER (ASJ - ALL SERVICE JACKET)

A. Encase pipe fittings insulation with one-piece premolded PVC fitting covers, fastened as per manufacturer's recommendations. PVC fitting covers must have a flame spread rating of 25 or less and a smoke developed rating of 50 or less per ASTM E84.

1. Above not required for flexible unicellular insulation.

B. Under premolded PVC fitting coverings, like Zeston 2000, install mitered sections of pipe insulation to provide same thickness and density as adjacent pipe covering. Mitered segments of pipe insulation are required for fittings under PVC fitting covers when installing fiberglass insulation.

C. General Note: If a premolded PVC fitting is found crushed or indented after installation and the filler material, upon inspection, is found to be out of specification, the Insulation Contractor shall, at no charge to the Owner, remove any other Zeston fitting covers, directed by the Engineer on any
other specified pipe systems for visual inspection, repair and replace all out of specification fitting fillers and then reinstall all fitting covers.

D. Encase interior pipe fittings insulation (unless otherwise noted) with one-piece premolded PVC fitting covers, fastened as per manufacturer’s recommendations. (See thickness and density requirements stated above).

E. Staples and Cement: As recommended by insulation manufacturer for applications indicated.

F. Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

2.5 PIPING INSULATION MATERIALS

A. Fiberglass Piping Insulation: ASTM C547, Class 3 for use to 850° F.

B. Flexible Unicellular Piping Insulation: ASTM C534, Type I (tubular) or Type II (sheet), for use between -40° F and 220° F only. Fire Retardant, 25/50 FS/SD.

2.6 EQUIPMENT INSULATION MATERIALS

A. Rigid Fiberglass Equipment Board Insulation: ASTM C612, Class FSK facing.
   1. CLASS 1 - 450° F
   2. CLASS 1 - 6 LBS./CU. FT.

B. Semi-Rigid Fiberglass Equipment Insulation for Round Vessels: ASTM C1136, Class 7, FSK facing.
   1. CLASS 7 - 650° F
   2. CLASS 7 - 3 LBS./CU FT.

C. Jacketing Material for Equipment Insulation: On all equipment not having the FSK jacket, provide pre-sized glass cloth covering material, not less than 8.0 ounces per square yard.

D. Equipment Insulation Compounds: Provide adhesives, cements, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.

E. Equipment Insulation Accessories: Provide staples, bands, wire, wire netting, tape, corner angles, anchors, and stud pins as recommended by insulation manufacturer for applications indicated.

F. Refrigerant hot gas and hot liquid piping shall be insulated on the roof with fiberglass piping insulation covered with VentureClad® 1577CW-WE vapor barrier pipe covering, up to the height of 8’-0” above the roof level and left bare above that height. Seal VentureClad® at ends to prevent rainwater from entering insulation layer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which mechanical insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
3.2  ICE PLANT REFRIGERATION PIPING SYSTEM INSULATION

A.  Note that all elements in the piping systems are required to be covered. Fittings, appliances of any kind, expansion compensators, and/or any other pipeline device must be covered with the same materials and thicknesses as listed in the following paragraphs, for the piping system in which they install.

B.  All refrigerant control valves in the piping system shall be left uninsulated. Taper and seal pipeline insulation adjacent to them neatly.

C.  Cover all surfaces exposed from the refrigeration package on the roof to through the rink header trench subject to condensation with polystyrene. Examples of material to be insulated are:

1.  Cold glycol pipe surfaces
2.  Piping to expansion tank and the expansion tank next to the refrigeration unit.

D.  Insulation Thicknesses: Insulate each piping system specified in Paragraph 3.2 B with one of the following thicknesses:

1.  Refrigerant Suction  
   - 1-1/4 to 4"  
   - 2.0"
2.  Cold Refrigerant and Glycol Pipe  
   - Up to 2"  
   - 1.5"
3.  Ultra-low Temperature Equipment  
   - 2.5"-8"  
   - 2.0" sheet with SARAN™ and ASJ jacket described above

E.  Other Ice Plant Surfaces: Insulate each piping system not specified in Paragraph 3.2 C with one of the following types and thicknesses of insulation:

1.  Fiberglass:  
   a.  Piping  
      - 1" thick for pipe sizes through 2"  
      - 1-1/2" thick for pipe sizes 2-1/2" and larger
   b.  Equipment Items  
      - 2" thick, 6 lb. rigid or semi-rigid board, with FSK covering

2.  Flexible Unicellular (indoor use only):  
   a.  Sheet type for irregular equipment coverings  
      - 1" thick
   b.  Glycol Floor Pumps  
      - Two 3/4" layers, glued to pump heads, all joints staggered

3.3  ICE PLANT SYSTEM INSULATION

A.  Note that most elements in the piping systems are required to be covered. Fittings, appliances of any kind, expansion compensators, and/or any other pipeline device must be covered with the same materials and thicknesses as listed in the preceding paragraphs, for the piping system in which they are installed.
3.4 INSTALLATION OF PIPING INSULATION

A. General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

B. Install insulation on pipe system subsequent to testing and acceptance of tests.

C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation with single cut piece to complete run. Do not use cut pieces or scraps abutting each other.

D. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

E. Butt pipe insulation joints firmly together for cold and for hot pipes. Apply 3" wide vapor barrier tape or band over the cold pipe butt joints.

F. Maintain integrity of vapor barrier jackets on pipe insulation, and protect to prevent puncture or other damage. Repair all punctures with tape designed for duty.

G. Cover valves, fittings, and similar items in each piping system, unless specifically allowed to be omitted, with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut or job fabricated units (at Installer's option) except where specific type is indicated.

H. Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.

I. Insulation Shields and Protection Saddles: Provide insulation shields at each hanger site in accordance with detail on drawings. Shields to be furnished and installed by insulation trade. Over-size pipe hangers will be furnished and installed by the piping trades. Insulation must be continuous thru hangers.

3.5 INSTALLATION OF EQUIPMENT INSULATION

A. General: Install equipment thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.

B. Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.

C. Maintain integrity of vapor barrier on equipment insulation and protect it to prevent puncture and other damage.

D. Apply insulation using staggered joint method for both single and double layer construction, where feasible. Apply each layer of insulation separately.

E. Provide removable insulation sections to cover part of equipment, which must be opened periodically for maintenance; include metal vessel covers, fasteners, flanges, frames, and accessories.
3.6 GENERAL CLEANING AND PAINTING

A. All piping and non-insulated surfaces to be cleaned and free from all construction debris. All bare piping shall be painted per colors chosen by owner. All painted surfaces that are over 100 degrees in temperature shall be painted with appropriate paint for high temperatures.

B. Manufacturer supplied pre-painted shall be cleaned and touch up paint shall be applied to provide equipment in new condition. Paint shall match existing manufacturer paint, or component can be repainted. This includes compressors, pumps, and vessels.

C. Support members used in the support of equipment and piping shall be painted with corrosion resistant paint.

END OF SECTION
PART 1 - GENERAL

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

1.2 WORK INCLUDED
   A. Ice rink roll out rink piping system including:
      1. Ice rink refrigeration distribution headers adjacent the rink floor.
      2. Ice rink refrigeration roll out tubing in the rink floor.
      3. Supply and return glycol piping from the rink to the refrigeration package on the roof.

1.3 SUBMITTALS
   A. Submit the following for review.
      1. Product data
      2. Scaled layout drawing showing all sections of conduit system. Show grades, underground utilities, buildings, pipe invert elevations, locations of anchors, oversized elbows and other parts of system.

PART 2 - PRODUCTS

A. Manufacturer shall have had at least ten years experience in the manufacture of the type of product shown on plans and specified herein. Evidence of this experience shall accompany submittal documents.

2.2 ICE RINK PIPING SYSTEM
   A. Under this section the contractor shall supply and install one complete 100’ wide x 192’ long Roll-Out-Rink prefabricated ice rink floor piping system. The base system is manufactured and supplied by Custom Ice Inc of Burlington, Ontario Canada. Phone: (905) 632-8840, or approved equal.

   B. The rink configuration will include a prefabricated Roll-Out-Rink floor piping system complete with supply and return headers.

2.3 RINK FLOOR PIPING
   A. The contractor shall supply and install a Roll-Out-Rink prefabricated ice rink piping system. The system will consist of 48 piping rolls each 4’ wide and 100’ long. Each piping roll will consist of 32 @ 5/8” linear low density polyethylene tubes. Tubes will be spaced at 1.5” c/c with integral spacer strips at 18” c/c. Spacer strips will be composed of perforated HDPE plastic strips to hold the tubes tight to maintain tube spacing at 1.5” c/c.

   B. Tubes will be connected to 1” supply and return subheaders using stainless steel hose clamps. Each sub header will consist of 1” copper construction with 16 copper nipples spaced at 3” c/c. One supply and one return subheader will be used for each piping roll. Connections to subheaders will be of reverse return configuration.
C. Connections at the opposite end to the subheaders shall be made with copper U tubes or reversing sub headers. Each reversing sub header will consist of 1” copper construction with 32 copper nipples spaced at 1.5” c/c. Tubes will be connected to reversing sub headers using stainless steel hose clamps. One reversing subheader will be used for each piping roll.

D. Subheaders will connect to main headers using steel hose barbs, with 1” red 100 psi rubber hose and stainless steel hose clamps.

2.4 HEADER PIPES

A. The system shall include 6” schedule 10 galvanized steel header pipes. Pipes will run the length of the rink on one side only. Each header will be 20’ long with grooved connections on each end. Victaulic type grooved pipe connectors will be used to connect each pipe adjoining headers. Connections to the subheaders will be made with Victaulic connectors having 1” threaded fittings and steel hose barbs.

B. Headers will be provided with flanged connections for supply and return lines on end of each header pipe.

C. Connections to main headers from refrigeration package to be field fabricated and located as shown on the drawings. Transmission piping from refrigeration package to rink floor headers to be schedule 40 steel welded.

D. Provide insulation as specified elsewhere and as shown on the drawings for the transmission piping and rink headers adjacent the rink.

E. Welds shall be performed by fully trained and experienced site personnel. Documentation of training and experience to be submitted.

F. Testing: Air pressure test roll out rink piping and headers to 60 psi and soap every joint in the system. Hold for 24 hours.

G. Testing: Air pressure test steel transmission piping to 80 psi and soap every joint. Install butterfly isolation valves at the end of the schedule 40 steel run just prior transitioning to the rink headers to separate tests. Upon completion of the transmission piping testing the entire piping system may be tested to 60 psi and valves opened.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated except where deviations to layout are approved on coordination drawings.

B. Install piping components having pressure rating equal to or greater than system operating pressure.

C. Install piping free of sags and bends.

D. Locate groups of pipes parallel to each other, spaced to permit servicing.
E. Install fittings for changes in direction and branch connections.

F. Fittings not permitted are:
   1. Elbows, tees, and pipe reducers fabricated from pipe.
   2. Tees and elbows fabricated by butt welding branch line to main.

3.2 PIPING INSTALLATION

A. General: Installation of piping system shall be in accordance with the specifications and piping system manufacturer instructions. Pipe welders shall be certified by the Manufacturer and certifications of all welders submitted prior starting any welding.

B. Open ends of pipe lines and equipment shall be properly capped or plugged during installation to keep dirt or other foreign matter out of the system.

END OF SECTION
SECTION 13 18 16 - ICE RINK DASHER BOARDS

PART 1 - GENERAL

1.1 PROJECT SCOPE

A. Contractor shall furnish and install one complete set of steel framed dasherboards as indicated on the drawings and specified herein. The contractor shall be responsible for all necessary labor, materials, equipment, and services to complete the project.

1.2 SUBMITTALS

A. The contractor shall upon receipt of contract from Owner, prepare a set of shop drawings which will itemize sizes and materials as well as construction details for installation. The manufacturer will submit drawings to the Contractor for review and submittal to the Engineer, Architect or Owner for approval prior to actual fabrication of materials.

B. Polyethylene samples shall be submitted for Owner approval of color and quality.

1.3 QUALITY ASSURANCE

A. All materials shall be per plans and specifications and constructed, manufactured, and installed per plans and specifications. All equipment and materials supplied under these specifications shall be new and of the highest grade material and construction.

B. Any deviation from this specification, unless approved by the owner prior to bidding, shall be corrected at the supplier’s expense.

C. Approved dasherboard systems, manufacturers and installers:

   2. Becker Arena Products
   3. Sportsystems Athletica

D. Any other manufacturer wishing to submit bids must receive prior approval and be added by addendum to be allowed. To receive approval prior to bid, dasherboard contractors must:

   1. Provide evidence of at least five (10) installations identical in construction to the following specifications, each with a minimum of five (5) years operating experience prior to the bidding date. A list of these installations including names, addresses, contacts, and telephone numbers is to be included with requests for prior approval.

   2. Submit a sample panel of proposed dasherboard system being bid showing exactly how the system will be manufactured. Samples shall show how shield mounting hardware will be attached to system, as well as samples of gate latches, hinges, and related hardware.

   3. Submit dasher shop drawings detailing systems design. Drawings must be prepared and approved by a licensed professional engineer.

   4. Approval must be obtained at least 10 days prior to the bid date.
1.4 GUARANTEE

A. Manufacturer shall warranty all equipment provided under this project against all defects in materials and/or workmanship for a period up to three years from the date of completed installation.

1.5 DELIVERY

A. To be arranged to coordinate with completion date of the project. Delivery date shall allow for sufficient installation time prior to project completion date.

PART 2 - PRODUCTS

2.1 RINK DIMENSIONS

A. Rink size shall be nominally 100’ wide x 192’ long with 28’ radius corners. All dimensions to be field verified prior manufacturing and installation of the system to ensure meeting site conditions.

2.2 MATERIALS AND EQUIPMENT

A. Demountable Frame Sections:

1. Dasher panels shall be fabricated in demountable sections of nominal 8’ lengths. The design of all panels, whether straight sections, curved sections, or sections in which a gate is located shall be fundamentally similar.

2. At the front, each section shall be made of two horizontal 2” x 1-1/2” x 3/16” steel angles used at the top and intermediate locations and one horizontal 2” x 1-1/2” x 1/4” steel angle used at the base location.

3. At the back, each section shall be made of one 1-1/2” x 1” x 14 ga. steel square tube used at the top location and one 1-1/2” x 1-1/2” x 1/4” steel angle used at the base location.

4. Where backer panels are specified, an additional 1-1/2” x 1” x 14 ga. steel rectangular tube shall be used at the back intermediate location to aid in fastening and supporting the backer sheets.

5. All horizontal angles and tube shall be welded to end plates on each end of the panel. The end plates shall be made of two 2-1/2” x 2” x 3/16” steel angles welded to three 1/4” x 3” x 4” steel plates.

6. Each end plate shall have three 9/16” matching holes to accommodate 1/2” through bolts.

7. All panels over 5’ in length shall have and additional 3” x 1-1/2” x 14 ga. steel rectangular tube welded vertically at the center of the panel to add rigidity.

8. All steel angles used in the dasher panels and gate sections shall be pre-punched with slotted holes to allow expansion and contraction in the polyethylene dasher facing due to changes in temperature. Round holes and self-tapping screws are not acceptable.

9. Each panel is to be a complete welded construction. After construction of the framing, each panel shall be hot dip galvanized.
10. Standard size of dasher panel frame shall be 96” long x 41” high x 6” thick.

11. Dasherboard system shall be self supporting. Systems which require separate support posts to support the dasherboard system are not acceptable.

B. Floor Anchors:

1. The dasher contractor may supply all new steel cast in place anchors and hardware, as detailed on the drawings in newly poured perimeter concrete support curb. Portions of rink perimeter shall be installed on existing rink floor concrete. Contractor to verify slab is suitable for installation of dasherboard system and allow for any requirements for anchoring system to existing floor.

2. The dasher contractor shall supply 1/2” x 4” x 4-1/2” galvanized steel hold down plates. Plates shall have a 7/8” hole to accept a 5/8” bolt and flat washer for securing the dasher panels to the 5/8” epoxy sleeve type floor anchors. Each panel shall be fastened to the floor with a minimum of two 5/8” anchors and bolts per 8’ section.

3. In applications where the dasherboards are to be removed, all anchors shall be supplied with flush plugs.

C. Dasher Facing:

1. Dasherboard facing shall be 1/2” thick stress relieved high density virgin polyethylene. Reprocessed or reground polyethylene is not acceptable.

2. Polyethylene shall be bright white in color. Color of facing shall be consistent throughout the system. Natural white is not acceptable.

3. Facing panels shall be one piece and cut to match length of demountable framing sections.

4. On panels that require red or dark blue lines, the facing shall be removed by the widths specified so that a 1/2” thick red or dark blue panel of high molecular weight polyethylene can be inserted. Lines shall extend from the kickplate to the caprail.

5. The 1/2” polyethylene shall be attached to the horizontal and vertical frame angles with 1/4” Phillips flat head machine screws, and flanged lock nuts where possible. Spacing of fasteners shall not exceed 10” on center. All exposed fastener heads shall be painted to match facing color.

D. Caprail:

1. The caprail shall be constructed of 3/4” thick high density polyethylene. The caprail must have a textured or mat finish. A smooth finish shall be unacceptable.

2. The 3/4” caprail shall be attached to the front horizontal frame angle with 1/4” Phillips flat head machine screws, and flanged lock nuts where possible. The back edge shall be attached to the horizontal frame tube with 1/4” Phillips flat head type “F” thread forming screws. Spacing of fasteners shall not exceed 24” on center. All exposed fastener heads shall be painted to match caprail color.
3. The caprail shall have smooth and radiused edges on the front and back edges.

4. Caprail to be red or blue in color.

E. Kickplate:

1. Kickplate shall be constructed of 1/2" thick, 10" high, high density polyethylene, and shall surround the entire rink.

2. The top edge of the kickplate shall be beveled.

3. The 1/2" kickplate shall be attached to the bottom of the dasher panel with 1/4" Phillips flat head machine screws, and flanged lock nuts where possible. All fastener heads used to attach kickplate to dasher panels shall be painted to match the kickplate color.

4. Red center line and blue lines shall be flush or integral with the kickplate.

5. Kickplate shall be yellow, light blue, or NHL gold in color.

6. At the base of the kickplate, an 1/8" galvanized aircraft cable shall be installed around the perimeter for attaching matt system tubing. Cable shall be secured using 1/4" zinc plated steel eyehooks threaded into bottom dasherboard framework every 2’.

F. Access and Players’ Gates:

1. Access gates shall be 3'-0" wide and/or 4'-0" wide in quantity as specified in the drawings.

2. Double door access gates shall be 5'-0" wide or 6'-0" wide in quantity as specified in the drawings.

3. Players’ and penalty gates shall be 2'-6" wide in quantity as specified in the drawings.

4. Gates shall be built into 8’ dasher panels and shall be left or right hand swing as specified in the drawings.

5. Gate panels shall be constructed of the same materials and methods as the demountable frame panels, except the end plates are made of preformed 1/8” thick steel channels.

6. The double bar gate latch mechanism shall be designed so the gate can be closed and latched in a single movement. The gate handle shall be designed so players wearing hockey gloves can easily open the gates. Latches shall be of solid welded steel construction. Single bar, or spring loaded bolt latches shall be unacceptable.

7. Hinges for all gates shall be of steel construction and bolted to the frame for easy maintenance, two per gate door. Hinges to have ¼” horizontal, and ½” vertical adjustment. Hinges shall have 1/2" internal steel ball bearing, oilite bushings and grease fittings for lubrication purposes. Hinges shall be designed so gates can be lifted off and removed. Common bracket hinges, or hinges welded to the frame shall be unacceptable.

8. All single swing access and player gates shall have 3/8” x 3-1/2” x 3” door stops welded to the frame gate. All gate with shielding shall be equipped with push button releases located on the caprail on the ice side of the shielding. Latches shall be designed so players wearing hockey gloves can easily open the gates.
9. Gates with shielding shall be made to accept shield mounting hardware.

10. Thresholds for access gates shall be approximately 3" above floor level.

11. Thresholds for players' and penalty box gates shall be 9" above floor level.

G. Equipment Gate:

1. Equipment gate shall be a double leaf gate with a 10'-0" opening. Each leaf shall be 5' wide.

2. Gate panels shall be constructed of the same materials and methods as the demountable frame panels, except the end plates are made of preformed 3/16" thick steel channels.

3. Hinges for equipment gate shall be of steel construction and bolted to the frame for easy maintenance, two per gate door. Hinges to have ¼” horizontal, and ½” vertical adjustment. Hinges shall have 1/2" internal steel ball bearing, oilite bushings and grease fittings for lubrication purposes. Hinges shall be designed so gates can be lifted off and removed. Common bracket hinges, or hinges welded to the frame shall be unacceptable.

4. Equipment gate latch shall be the sliding bar type, constructed of 2" x 2" x .12" square tubing for structural rigidity, with a large grasp handle. Slide bars fabricated from round tube shall be unacceptable.

5. Each equipment gate shall lock into the steel threshold with 5/8" x 12" long cane bolts.

6. Each equipment gate shall be equipped with a sturdy, gas compensated, spring loaded, adjustable caster. For safety and component protection, the spring shall be totally enclosed in the caster mechanism, casters with exposed springs shall be unacceptable.

7. Threshold for equipment gate shall be 2” above floor level. It shall be constructed of a 1-1/4” steel angle framework with a 3/4” polyethylene cover.

H. Hardware:

1. All steel hardware used during the construction or installation of the system shall be galvanized or zinc plated for rust resistance.

2. Hardware shall include hinges, latches, nuts, bolts, washers, and miscellaneous fastening devices necessary to complete installation.

I. Thresholds:

1. Access and players’ gates shall have 1” thick high molecular weight polyethylene, replaceable thresholds.

J. Spectator Shielding:

1. Shielding shall be clear float tempered glass, 5/8” thick on the ends and corner radii of the rink and 1/2” thick at the sides of the rink. Tempered glass shielding shall have the top two corners clipped and all edges ground to minimize breakage and for safety in handling. Seamed edges are not acceptable.
2. All shielding shall be 48" wide except those at gates, or similar openings in the dasherboards.

3. Height of spectator shielding shall be 6' above the dasher caprail at the ends and corners radii of the rink.

4. Height of spectator shielding shall be 6' above the dasher caprail at the sides of the rink.

5. Spectator shielding shall note be installed in front of players boxes

6. Spectator shielding shall be installed in front of penalty and scorekeepers boxes at a height of 6' above the dasher caprail.

7. Spectator shielding shall be installed behind and between box areas at a height of 6' above the dasher caprail.

8. A 3" diameter speaker hole shall be provided in shielding in front of scorer's box, 5' above the ice surface.

9. Specially designed vinyl covered foam safety pads shall be placed at all corners of spectator shielding inside rink to prevent injury. Color of padding shall match the caprail.

10. All spectator shielding shall be mounted in aluminum support posts unless otherwise specified.

K. Spectator Shielding Supports:

1. Spectator shield mounting supports shall be rectangular in design and of one piece construction. Two piece round support post with easily removeable faceplate is also available. Shield mounting supports shall be made of solid architectural grade aluminum (alloy #6061-T6). Supports shall be installed through a snug fitting contoured opening in the finished caprail and secured at the bottom with a support mounting bracket at the center horizontal angle of the dasher panel. Installation of shielding panels to be from the rink side with the vertical support posts within the dimensions of the panels. No protruding anchors shall extend behind the boards. Total width of supports shall be 2-1/4".

2. Spectator shield mounting supports shall be furnished with PVC gasketing to secure and cushion the shield panels.

3. Mounting hardware is to be removable so that the spectator shielding can be removed without demounting the dasher system. The round shield supports shall be attached at the center angle with clip angle fitting that extends a minimum of 1-1/4" into the support post.

4. Gate shield mounting hardware shall be made of architectural grade extruded aluminum (alloy #6061-T6). It shall be of one piece design to allow the operation of the gate sections.

5. The height of the supports above the caprail shall be 1" below the height of the shielding. Posts that allow more than a 1" glass reveal shall not be acceptable.
6. The spectator shield supports shall be nominally 48" apart except at gates or similar openings in the dasherboards.

L. Postless Shielding System

1. A 3" deep continuous aluminum track shall be built within the dasherboard panel to secure the glass. The track shall be designed so the glass panels can be easily installed and removed. The use of poly or plastic channels to hold the glass panels are unacceptable.

2. The bottom 3-1/2" of tempered glass shall be protected by a 3-1/2" “U” shaped poly cushion lining the shielding track support. Cushion of less than 3-1/2" are not acceptable.

3. A spring loaded polycarbonate clip, of one piece construction, shall be installed at the top of each glass termination connecting each glass panel to the next. Glass spacers shall also be included in the horizontal channel.

4. Spacing of each glass panel shall not exceed 3/8".

M. Boxes:

1. Boxes shall consist of two players boxes 30' in length, two penalty boxes 6' of length, and one official box 8' long. Box shall be 5' deep.

2. Incorporated into the players box areas shall be a shelf for the storage of water bottles, etc. This shelf shall be 1/2" white polyethylene identical in color of the 1/2" white facing material and be constructed as detailed on the drawings. The shelf shall be located between the players gates.

3. Backer panels of 3/8" high density polyethylene panels shall be attached to the back side of the dasherboard framework inside the players' boxes. Color shall be identical to that of the dasher facing panels. Backer panels shall extend the full height of the dasher, except at the shelf locations, where panels shall terminate at the height shown on the drawings. Panels shall be fastened to the framework using 1/4" Phillips flat head thread cutting screws.

4. One 1” x 20” x 8’-0” polyethylene score's table shall be installed in the officials box as shown on the drawings. The color of the table shall be white.

N. Wood Elevated Flooring:

1. Elevated flooring shall be furnished for players, officials and penalty box areas.

2. Flooring shall be constructed of 2” x 6” treated lumber set 16” on center. Flooring shall be 1" less than both the length and width of the box areas.

3. The wood framework shall be covered with 3/4" exterior grade plywood, and covered with 1/2" black cut resistant rubber flooring.

4. A two tier framework shall be constructed for a coaches walk behind the benches. The coaches walkway shall be elevated 7” above the standard floor height and shall be 18” deep. The construction of the walkway shall be identical to the elevated flooring in the box areas.
O. Benches:

1. The benches used in the players and penalty boxes shall be constructed of 3/4" thick by 9-1/2" wide smooth high density polyethylene with a steel reinforced base. Color must match the caprail material. Color shall match the caprail.

2. The players box benches shall be 28' in length. The penalty box benches shall be 6' in length.

2. The top edges of the benches will have a 3/8" radius and a 1/4" radius on the bottom edges.

3. The benches shall be supported using supports constructed of 8" x 8" x 1/4" steel plates welded to 2" x 2" x 11 ga steel square tubing. The bench supports shall be mitered 15 degrees toward the front of the boxes to prevent the players from hitting the supports with their skates.

4. The supports will not exceed 5'-0" on center and will be fastened to the bench material with 5/16" flat head bolts and 5/16" lock nuts.

P. Backer Panel:

1. 3/8" high density polyethylene panels shall be attached to the back side the dasherboard framework around the entire perimeter of the rink, including all access and players gates.

2. Backer panels will be fastened using 1/4" Phillips flat head thread forming screws. Spacing of fasteners shall not exceed 24" on center. All exposed fastener heads shall be painted to match backer panel color.

3. Standard colors of backer sheets are white.

Q. Netting:

1. Protective netting shall be black nylon mesh, 1-3/4" mesh, 420 lb. break strength. A nylon sewn border with grommets shall be surround the entire perimeter of netting.

2. Netting shall be 12' in height and be installed around the entire perimeter of rink, except in front of boxes. Netting shall be fastened to the shielding supports is such a way to prevent pucks from falling outside the rink area.

2.3 ADDITIONAL OPTIONS (may increase or decrease total bid)

A. Polyethylene Ice Retainer:

1. A 1" x 7" natural white high density polyethylene ice retainer shall be installed under the entire dasherboard system.

2. The ice retainer shall be installed using the same 5/8" anchors and bolts that secure the dasher panels to the floor.
B. Steel Ice Retainer:

1. A 6" x 2" hot dip galvanized steel ice retainer shall be installed under the entire dasherboard system. High density polyethylene shall be attached to the rink side of the ice retainer. Color shall match kickplate.

2. The ice retainer shall be fastened to the floor using separate 5/8" anchors and bolts. The ice dam shall incorporate threaded 5/8" inserts for attaching the dasherboard system.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Manufacturer shall construct, fabricate and deliver all materials to the job site per plans and specifications under the direct supervision of a licensed professional engineer. All materials shall be installed to result in a complete steel frame dasher system with all boards and shielding to be straight and true in line and properly braced. All installation work shall be completed by a factory installation crew.

B. Installation shall be in strict conformance with manufactures requirements and instructions. Erect units rigid, straight, level, plumb, and true with horizontal and vertical lines level, and securely anchored in place. Whether shown on the drawings or not, this contractor shall provide all accessory materials for a complete, finished installation. No defective, scratches, marred or otherwise equipment and materials shall be installed.

C. Put all items of equipment and systems through at least five complete cycles of operation, verifying that each item is properly installed and properly operating, and making required adjustments to achieve optimum operation.

3.2 CLEANING

A. Clean all surfaces removing all evidence of dirt, packaging materials and protective wrappings.

B. Replace all damaged materials including scratched glass.

END OF SECTION
PART 1 - GENERAL

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

1.2 WORK INCLUDED
A. Reciprocating compressors, compressor controls and oil separators.

1.3 QUALITY
A. Design and construction shall meet UL requirements and shall have labels appropriately affixed.
B. Wiring shall comply with the National Electrical Code current version.

1.4 WARRANTY
A. Provide factory warranty on ice plant all supplied components for a period of one (1) year.
   1. Warranty date for Ice Plant commences on the date of initial pull-down of the refrigerated floor and completion of the first sheet of ice.
B. Warranty: Includes devices and sensors, as manufactured and delivered to site including materials and labor.

1.5 SUBMITTALS
A. Submit manufacturer's product data for review including:
   1. Drawings indicating components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, wiring, and connections, for a complete system.
   2. Electrical power requirements for the ice plant process control system shall be documented.
   3. Instruction manuals and spare parts list.

PART 2 - PRODUCTS

2.1 100 TON CAPACITY OUTDOOR CHILLER PACKAGE
A. The basis of the design for this project is the refrigeration package as manufactured by Zero Zone, with their standard ice rink controls. Any contractors submitting alternate manufacturers products must provide a complete submittal prior to bidding the project and be formally approved via addendum prior the bid.
B. Acoustical Performance:
   1. Sound-pressure levels for the complete unit shall not exceed 93 dBA. Provide acoustic treatment as required. Sound data shall be measured in accordance
with ARI 575. Data shall be in dB, reference 0.0002 dyne/cm², measured along a perimeter 1 m from machine and at a height of 1.5 m above floor. Data shall be at the highest levels recorded in three operating positions: 100 percent load, 75 percent load, 50 percent load, and 20 percent load.

2. The maximum permissible noise level shall not exceed 94 dB in each octave band when measured as described in subparagraph 1 above.

3. Chiller fan shall be provided with a fan shroud to lower the sound level further.

C. Six (6) 34 HP Bitzer 6GE342NUOD reciprocating compressors which are split in two independent circuits.

D. Each circuit includes; coalescing oil separator, differential switch to monitor pressure drop across oil separator filter, main discharge check valve, vertical receiver, liquid drier, thermal expansion valves, liquid line solenoid, horizontal suction accumulator w/ heat exchanger loop, and suction filter.

E. Chiller system should utilize R407A refrigerant with compressor manufacture recommended POE oil.

F. Chiller system to use 40% ethylene glycol.

G. The two circuits are piped to a common dual circuited brazed plate DX heat exchanger.

H. The chiller is sized for +5° SST on the refrigeration side with 17° EWT and 14° LWT on the fluid side.

I. The total load for each chiller is 100 tons (50 tons per circuit).

J. The system will be controlled by a Allen Bradley Micro800 PLC controller, with a 7” PanelView 800 touchscreen. The control system includes input and output boards to control the compressors and condenser fans as well as monitoring temperatures and pressures throughout the system.

K. Chiller system to include a modem that can be used to monitor system performance from a remote location.

L. Chiller system to have emergency shut down switches w/red shutdown and green run label.

M. Crankcase heaters wire upstream of control circuit so that the heaters are energized if the control circuit shuts down.

N. Chiller system to have electrical panel forced ventilation.

O. The entire systems must have an ETL listing. Systems with only a control panel listing will not be accepted.

P. The chiller frame is constructed with structural steel that is welded and painted for corrosion protection. Two circulation pumps will be mounted on the chiller frame and powered from the compressor motor control panel.

Q. Package assembly to include insulated removable panels where applicable for service and access. Panels to be insulated for sound and interior lighting to be provided with on
off switch for service abilities. Interior exhaust fan to be provided and operated manually from the control panel.

R. This system is air-cooled and designed for year-round operation at 110° condensing temperature with a 15° temperature difference. Air cooled condenser to be Keeprite model: KCL260T4AC27V, with two circuits, each with 7 individual fans. Condenser to be mounted on top of refrigeration package and pre-piped, and wired from the factory.

S. Air Cooled condenser will be provided with individual fusing and contactors. Control boards for this will be mounted in the rack panel. Condenser fans to be controlled individually.

T. Chiller system will incorporate Zero Zones patented oil management systems to manage high oil levels in compressor during off cycles and continuously filter the oil.

U. Chiller system to have a complete factory hi-pot test with full electrical function test. Documentation of this test provided to owner before shipment.

V. Chiller system to have a complete factory pressure test with dry nitrogen up to 100 psi. Then a helium tracer gas to be added and system leak checked with a helium spectrometer. Documentation of this test should be provided to owner before shipment.

W. System to be shipped with a 50 psi charge of dry nitrogen tagged with date, time and ambient temp

X. Control system to have at a minimum safety shut down controls for low oil pressure, low suction pressure, high discharge pressure and high oil temperature. Indication lights to be panel mounted for easy notification of status of all each compressor, and any alarm condition light. Controller to allow secondary optional outputs for remote indication of any alarm status or system shut down due to any failure.

Y. Control system to automatically cycle compressors as required to maintain operator programmable set point for return glycol temperature. Control to automatically cycle compressors lead / lag function to maintain equal compressor run hours. Control panel to have manual switches to put compressors on line as well as individual breakers for each motor contained on the refrigeration package.

Z. Two glycol pumps to be provided, each to be full flow capacity of the ice system. Individual breakers and starters with operation lights to be provided for each pump. Pump cycling to be done manually by the operator.

AA. Isolation valves to be provided around each serviceable component of the ice rink package for both the primary and secondary refrigerants.

BB. A single remote mounted 100 gallon expansion tank, with sight glass, and air control fitting to be provided on top and outside of the refrigeration package. Expansion tank to be supported by structural steel from the structural steel supporting the entire refrigeration package.

CC. Start-up services on the refrigeration package must be provided and included by factory authorized technician.

DD. Warranty: The complete compressor unit (except motor) shall be fully warranted against defects of material and workmanship under normal use and service for a period of two years on complete package, with an additional 5 years on the internals of the compressor.
and 5 years on the compressor bearings, from the date of shipment, regardless of startup date.

2.2 ICE PLANT PROCESS MISCELLENOUS CONTROLS AND MONITORING SYSTEM

A. Rink glycol supply and return temperature monitoring.

   1. Provide temperature thermometers in the Zamboni room located on the supply and return glycol piping for operator monitoring. Additionally provide a temperature sensor and temperature read out panel in the Zamboni room indicating the return glycol temperature from the rink floor. Temperature sensor to be 100 ohm, 3 wired, rtd probe. Probes wired to temperature readout panel located in the Zamboni room. Temperature readout control to have a minimum of 1 relay and programmable to allow for high glycol temperature indication.

PART 3 - EXECUTION

Not applicable

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping Insulation.
B. Insulation Jackets.

1.2 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with five years minimum experience.
B. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, or UL 723 (where required).

1.3 REFERENCES

B. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
C. ANSI/ASTM C534 - Elastomeric Foam Insulation.
D. ASTM C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Insulation.
E. ASTM E84 - Surface Burning Characteristics of Building Materials.
G. UL 723 - Surface Burning Characteristics of Building Materials.

PART 2 - PRODUCTS

2.1 INSULATION

A. Type A: Glass fiber; ANSI/ASTM C547; 0.24 maximum 'K' value at 75ºF; non-combustible. All purpose, white kraft jacket bonded to aluminum foil and reinforced with fiberglass yarn, 25/50 flame spread/smoke developed rating when tested in accordance with ASTM E84 (UL 723).

B. Type E: Preformed rigid cellular polyisocyanurate insulation; ANSI/ASTM C591; maximum 'K' value of 0.19 at 75ºF; moisture resistant; suitable for -297ºF to +300ºF.

2.2 VAPOR BARRIER JACKETS

B. Polyvinylidene Chloride (PVDC or Saran) film and tape: Durable and highly moisture and moisture vapor resistant. Please refer to manufacturer’s recommended installation guidelines.

2.3 JACKET COVERINGS

A. Plastic Jackets and Fitting Covers: High impact, glossy white, 0.030” thick, self-extinguishing plastic. Suitable for use indoors or outdoors with ultraviolet inhibitors. Suitable for -40°F to 150°F. 25/50 maximum flame spread/smoke developed.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install insulation after piping has been tested. Pipe shall be clean, dry and free of rust before applying insulation.

3.2 INSTALLATION

A. General Installation Requirements:

1. Install materials per manufacturer’s instructions, building codes and industry standards.

2. Continue insulation with vapor barrier through penetrations. This applies to all insulated piping. Maintain fire rating of all penetrations.

3. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. The insert shall be suitable for planned temperatures, be suitable for use with specific pipe material, and shall be a 180° cylindrical segment the same length as metal shields. Inserts shall be a cellular glass (for all temperature ranges) or molded hydrous calcium silicate (for pipe with operating temperatures above 70°F), with a minimum compressive strength of 50 psi. Polyisocyanurate insulation with a minimum compressive strength of 24 psi is acceptable for pipe sizes 3” and below, minimum 60 psi for pipe sizes 4” and above, and operate below 300°F. Factory fabricated inserts may be used. Rectangular blocks, plugs, or wood material are not acceptable. Temporary wood blocking may be used by the Piping Contractor for proper height; however, these must be removed and replaced with proper inserts by the Insulation Contractor.

4. Neatly finish insulation at supports, protrusions, and interruptions.

5. Install metal shields between all hangers or supports and the pipe insulation. Shields shall be galvanized sheet metal, half-round with flared edges. Adhere shields to insulation. On cold piping, seal the shields vapor-tight to the insulation as required to maintain the vapor barrier, or add separate vapor barrier jacket.

6. Shields shall be at least the following lengths and gauges:

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<thead>
<tr>
<th>Pipe Size</th>
<th>Shield Size</th>
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<tr>
<td>1/2” to 3-1/2”</td>
<td>12” long x 18 gauge</td>
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7. On 1” and smaller piping routed through metal wall studs, provide a plastic grommet to protect the piping. The piping shall be insulated between the wall studs, and the insulation shall butt up to each stud.

B. Insulated Piping Operating Below 60°F:

1. Insulate fittings, valves, unions, flanges, strainers, flexible connections, flexible hoses, and expansion joints. Seal all penetrations of vapor barrier.

2. On piping operating below 60°F in locations that are not mechanically cooled (e.g., penthouses, mechanical rooms, tunnels, chases at exterior walls, etc.), Type B insulation shall be used.

3. All balance valves with fluid operating below 60°F shall be insulated with a removable plug wrapped with vapor barrier tape to allow reading and adjusting of the valve.

C. Exposed Piping:

1. Locate and cover seams in least visible locations.

2. Where exposed insulated piping extends above the floor, provide a sheet metal guard around the insulation extending 12” above the floor. Guard shall be 0.016” cylindrical smooth or stucco aluminum and shall fit tightly to the insulation.

3.3 INSULATION

A. Type A Insulation:

1. All Service Jackets: Seal all longitudinal joints with self-seal laps using a single pressure sensitive adhesive system. Do not staple.

2. Insulation without self-seal lap may be used if installed with Benjamin Foster 85-20 or equivalent Chicago Mastic, 3M or Childers lap adhesive.

3. Apply insulation with laps on top of pipe.

4. Fittings, Valve Bodies and Flanges: For 4” and smaller pipes, insulate with 1 lb. density insulation wrapped under compression to a thickness equal to the adjacent pipe insulation. For pipes over 4”, use mitered segments of pipe insulation. Finish with preformed plastic fitting covers. Secure fitting covers with pressure sensitive tape at each end. Overlap tape at least 2” on itself. For pipes operating below 60°F, seal fitting covers with vapor retarder mastic in addition to tape.

B. Type E Insulation:

1. Indoors, above grade or below grade, Polyvinylidene chloride (PVDC or Saran) vapor retarder film and tape: Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner. Refer to manufacturer’s recommendations for installation guidelines.

2. Insulate pipe fittings with prefabricated insulation fittings.
3.4  JACKET COVER INSTALLATION

A. Plastic Covering:

1. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.

2. Solvent weld all joints with manufacturer recommended cement.

3. Overlap all laps and butt joints 1-1/2” minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.

4. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1” on circumferential and 1.5” to 2” on longitudinal seams.

5. Use plastic insulation covering on all exposed pipes including, but not limited to:
   a. All exposed piping in Zamboni Room and ice arena.

3.5  SCHEDULE

<table>
<thead>
<tr>
<th>Piping System</th>
<th>Insulation Type/Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Cold Water - Potable and Non-Potable</td>
<td>A / 1” OR E / 3/4”</td>
</tr>
</tbody>
</table>

END OF SECTION
SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pipe and Pipe Fittings.
B. Valves.
C. Domestic Water Piping System.
D. Storm Drainage Piping System.

1.2 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body. Remanufactured valves are not acceptable.
B. Piping, Fittings, Valves, and Flux for Potable Water Systems: All components shall be lead free per Federal Act S.3874, Reduction of Lead in Drinking Water Act.

1.3 REFERENCES

A. ANSI/ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings.
B. ANSI/ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
C. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings Class 150 NS 300.
D. ANSI/ASME B16.5 - Pipe Flanges and Flanged Fittings.
F. ANSI/ASTM B32 - Solder Metal.
H. ASTM D2661 - ABS DWV Pipe & Fittings.
L. NSF - National Sanitation Foundation

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store valves in shipping containers with labeling in place.

1.5 COORDINATION DRAWINGS

A. Reference Coordination Drawings article in Section 23 05 00 for required plumbing systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.
PART 2 - PRODUCTS

2.1 COLD WATER - POTABLE AND NON-POTABLE

A. Design Pressure: 175 psi.
   Maximum Design Temperature: 200°F.

B. Piping - All Sizes:
   1. Tubing: Type L hard drawn seamless copper tube, ASTM B88.
   2. Joints: Solder with 100% lead-free solder and flux, ASTM B32.

C. Piping - 4” and Under (Contractor’s Option):
   1. Tubing: Type L hard drawn seamless copper tube, ASTM B88.

D. Piping - 2” and Under (Contractor’s Option):
   1. Tubing: Type L hard drawn seamless copper tube, ASTM B88.
   2. Joints: Mechanical push-to-connect.

E. Shutoff Valves:
   1. Ball Valves:
      a. BA-1:
         1) 3” and under, 150 psi saturated steam, 600 psi CWP, full port, screwed or solder ends (acceptable only if rated for soldering in line with 470°F melting point of lead-free solder), bronze body of a copper alloy containing less than 15% zinc, stainless steel ball and trim, Teflon seats and seals. Apollo #77C-140, Stockham #S-255-FB-P-UL BR1-R, Milwaukee #BA-400, Watts, Nibco #585-70-66, National Utilities Co., RUB.

NOTES:

a) Provide extended shaft for all valves in insulated piping.

b) Provide lock out trim for all valves opening to atmosphere installed in domestic water piping over 120°F, heating
water piping over 120°F, steam, condensate, boiler feed water piping, compressed air piping and gasoline/kerosene piping, and as indicated on the drawings. Solid extended shaft is not required on valves with lock out trim.

2.2 STORM DRAINAGE (ABOVE GROUND)

A. Design Pressure: Gravity
   Maximum Design Temperature: 180°F

B. Piping - All Sizes:
   1. Pipe and Fittings: Standard weight cast iron soil pipe, corrosion protective coating inside and outside, ASTM A74, NSF Certified, CISPI Trademark.
   2. Joints: Compression gasket, ASTM C564 or lead and oakum, ASTM B29.
   3. Adapters: Transitions from cast iron soil pipe to other pipe materials with manufactured adapters. Heavy duty neoprene sleeve gasket, ASTM C-564, 300 Series stainless steel shield, clamp, and screws with not less than four screw type clamps, FM 1680 or ASTM C1540.

2.3 UNIONS

A. Copper pipe - wrought copper fitting - ground joint.
B. Black Steel (Schedule 40) Pipe - malleable iron, ground joint, 150 psi, bronze to bronze seat.
C. Galvanized Steel Pipe - galvanized malleable iron, ground joint, 150 psi, bronze to bronze seat.

2.4 AIR VENTS

A. Provide means for venting air at all high points in the piping system and at all other points where air may be trapped.
B. At end of main and other points where large volume of air may be trapped - Use 1/4” globe valve, angle type, 125 psi, Crane #89, attached to coupling in top of main, 1/4” discharge pipe turned down with cap.

2.5 DRAIN VALVES

A. Drain valves shall be shutoff valves as specified for the intended service with added 3/4” male hose thread outlet and cap.

2.6 CONNECTIONS BETWEEN DISSIMILAR METALS

A. Connections between dissimilar metals shall be insulating dielectric types that provide a water gap between the connected metals, and that either allow no metal path for electron transfer or that provide a wide water gap lined with a non-conductive material to impede electron transfer through the water path.
B. Joints shall be rated for the temperature, pressure, and other characteristics of the service in which they are used, including testing procedure.
C. Aluminum, iron, steel, brass, copper, bronze, and stainless steel are commonly used and require isolation from each other with the following exceptions:

1. Iron, steel, and stainless steel connected to each other.
2. Brass, copper, and bronze connected to each other.
3. Brass or bronze valves and specialties connected to steel, iron, or stainless steel in closed systems. Where two brass or bronze items occur together, they shall be connected with brass nipples.

D. Dielectric protection is required at connections to equipment of a material different than the piping.

E. Screwed Joints (acceptable up to 2" size):

1. Dielectric waterway rated for 300 psi CWP and 225°F.

F. Flanged Joints (any size):

1. Use 1/8" minimum thickness, non-conductive, full-face gaskets.
2. Employ one-piece molded sleeve-washer combinations to break the electrical path through the bolts.
3. Sleeve-washers are required on one side only, with sleeves minimum 1/32" thick and washers minimum 1/8" thick.
4. Install steel washers on both sides of flanges to prevent damage to the sleeve-washer.
5. Separate sleeves and washers may be used only if the sleeves are manufactured to exact lengths and installed carefully so the sleeves must extend partially past each steel washer when tightened.

2.7 LOCK OUT TRIM

A. Provide lock out trim for all quarter turn shutoff valves opening to atmosphere and installed in domestic water piping over 120°F, in compressed air piping, and as indicated on the drawings.

2.8 VALVE OPERATORS

A. Provide handwheels for gate valves and gear operators for butterfly valves.

2.9 VALVE CONNECTIONS

A. Provide all connections to match pipe joints. Valves shall be same size as pipe unless noted otherwise.
PART 3 - EXECUTION

3.1 PREPARATION
A. Install all products per manufacturer’s recommendations.
B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
C. Remove scale and dirt, on inside and outside, before assembly.
D. Connect to equipment with flanges or unions.

3.2 TESTING PIPING
A. Storm Drainage:
1. Test all piping with water to prove tight.
2. Test piping before insulation is applied.
3. Hydrostatically test all soil, waste, and vent piping inside of building with 10 feet head of water for 15 minutes. Inspect before fixtures are connected. If leaks appear, repair them and repeat the test.
4. A smoke/air test at the same pressure may be used in lieu of the hydrostatic water test. Exception: Smoke/air test shall not be performed on plastic piping.
5. Test pressures stated above shall be as listed or as required by the Authority Having Jurisdiction, whichever is most stringent.
B. Cold Water - Potable and Non-Potable:
1. Test all pipes before the insulation is applied. If insulation is applied before the pipe is tested and a leak develops which ruins the insulation, replace damaged insulation.
2. Test the pipe with 100 psig water pressure or equal inert gas such as nitrogen.
3. Hold test pressure for at least 2 hours.
4. Test to be witnessed by the Architect/Engineer’s representative, if requested by the Architect/Engineer.

3.3 CLEANING PIPING
A. Assembly:
1. Before assembling pipe systems, remove all loose dirt, scale, oil and other foreign matter on internal or external surfaces by means consistent with good piping practice subject to approval of the Architect/Engineer's representative. Blow chips and burrs from machinery or thread cutting operation out of pipe before assembly. Wipe cutting oil from internal and external surfaces.
2. During fabrication and assembly, remove slag and weld spatter from both internal and external joints by peening, chipping and wire brushing.
3. Notify the Architect/Engineer's representative before starting any post erection cleaning in sufficient time to allow witnessing the operation. Consult with and obtain approval from the Architect/Engineer's representative with regard to specific procedures and scheduling. Dispose of cleaning and flushing fluids properly.

4. Prior to blowing or flushing erected piping systems, disconnect all instrumentation and equipment, open wide all valves, and be certain all strainer screens are in place.

B. All Water Piping:

1. Flush all piping using faucets, flush valves, etc. until the flow is clean.
2. After flushing, thoroughly clean all inlet strainers, aerators, and other such devices.
3. If necessary, remove valves to clean out all foreign material.

3.4 INSTALLATION

A. General Installation Requirements:

1. Provide dielectric connections between dissimilar metals.
2. Route piping in orderly manner and maintain gradient. Install to conserve building space.
3. Slope water piping and arrange to drain at low points.
4. Seal pipes passing through exterior walls with a wall seal per Section 23 05 29. Provide Schedule 40 galvanized sleeve at least 2 pipe sizes larger than the pipe.

B. Installation Requirements In Electrical Rooms:

1. Do not install piping or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet from the floor to the structural ceiling with width and depth equal to the equipment.

C. Valves/Fittings and Accessories:

1. Install shutoff valves that permit the isolation of equipment/fixtures in each room without isolating any other room or portion of the building. Individual fixture angle stops do not meet this requirement. Exception: Back-to-back rooms in no more than two adjacent rooms.
2. Provide clearance for installation of insulation and access to valves and fittings.
3. Install valve stems upright or horizontal, not inverted.
4. Provide one plug valve wrench for every ten plug valves 2” and smaller, minimum of one. Provide each plug valve 2-1/2” and larger with a wrench with set screw.

D. Storm Piping:

1. Install storm piping in the building with a slope of 0.25” per foot unless noted otherwise.
3.5 PIPE ERECTION AND LAYING

A. Carefully inspect all pipe, fittings, valves, equipment and accessories before installation. Any items that are unsuitable, cracked or otherwise defective shall be removed from the job immediately.

B. All pipe, fittings, valves, equipment and accessories shall have factory applied markings, stampings, or nameplates with sufficient data to determine their conformance with specified requirements.

C. Exercise care at every stage of storage, handling, laying and erecting to prevent entry of foreign matter into piping, fittings, valves, equipment and accessories. Do not install any item that is not clean.

D. Until system is fully operational, all openings in piping and equipment shall be kept closed except when actual work is being performed on that item or system. Closures shall be plugs, caps, blind flanges or other items specifically designed and intended for this purpose.

E. Run pipes straight and true, parallel to building lines with minimum use of offsets and couplings. Provide only offsets required to provide needed headroom or clearance and to provide needed flexibility in pipe lines.

F. Make changes in direction of pipes only with fittings or pipe bends. Changes in size only with fittings. Do not use miter fittings, face or flush bushings, or street elbows. All fittings shall be of the long radius type, unless otherwise shown on the drawings or specified.

G. Provide flanges or unions at all final connections to equipment, traps and valves.

H. Arrange piping and connections so equipment served may be totally removed without disturbing piping beyond final connections and associated shutoff valves.

I. Use full and double lengths of pipe wherever possible.

J. Unless otherwise indicated, install all piping, including shutoff valves and strainers, to coils, pumps and other equipment at line size with reduction in size being made only at control valve or equipment.

K. Cut all pipe to exact measurement and install without springing or forcing except in the case of expansion loops where cold springing is indicated on the drawings.

L. Unless otherwise indicated, branch take-offs shall be from top of mains or headers at either a 45° or 90° angle from the horizontal plane for air lines, and from top, bottom or side for liquids.

3.6 DRAINING AND VENTING

A. Unless otherwise indicated on the drawings, all horizontal water lines, including branches, shall pitch 1" in 40 feet to low points for complete drainage, removal of condensate and venting.

B. Maintain accurate grade where pipes pitch or slope for venting and drainage. No pipes shall have pockets due to changes in elevation.

C. Provide drain valves at all low points of water piping systems for complete or sectionalized draining.
D. Use eccentric reducing fittings on horizontal runs when changing size of pipes for proper drainage and venting.

E. Install air vents in accessible locations. If necessary to trap and vent air in a remote location, install an 1/8" pipe from the tapping location to an accessible location and terminate with a venting device.

F. All vent and drain piping shall be of same materials and construction for the service involved.

3.7 BRANCH CONNECTIONS

A. For domestic water and vent systems only, make branch connections with standard tee or cross fittings of the type required for the service.

B. Reducers are generally not shown. Where pipe sizes change at tee, the tee shall be the size of the largest pipe shown connecting to it.

C. Do not use double wye or double combination wye and eighth bend DWV fittings in horizontal piping.

D. Branch connections from the headers and mains may be mechanically formed using an extraction device. The branch piping connection shall be brazed connection for the following services only:
   1. Domestic water piping above grade.

E. Further limit use of mechanically formed fittings as follows:
   1. Must have at least same pressure rating as the main.
   2. Main must be type K or L copper tubing.
   3. Permanent marking shall indicate insertion depth and orientation.
   4. Branch pipe shall conform to the inner curve of the piping main.
   5. Main must be 1" or larger.
   6. Branch must be 3/4" or larger.

F. Branch connections from headers and mains may be cut into black steel pipe using forged weld-on fittings.

G. Forged weld-on fittings are limited as follows:
   1. Must have at least same pressure rating as the main.
   2. Main must be 2-1/2" or larger.
   3. Branch line is at least two pipe sizes under main size.

3.8 JOINING OF PIPE

A. Solder Joints:
   1. Make up joints with 100% lead-free solder, ASTM B32. Cut tubing so ends are perfectly square and remove all burrs inside and outside. Thoroughly clean sockets of fittings and ends of tubing to remove all oxide, dirt and grease just prior to soldering. Apply flux evenly, but sparingly, over all surfaces to be joined. Heat joints uniformly so solder will flow to all mated surfaces. Wipe excess solder, leaving a uniform fillet around cup of fitting.
   2. Flux shall be non-acid type.
3. Solder end valves may be installed directly in the piping system if the entire valve is suitable for use with 470ºF melting point solder. Remove discs and seals during soldering if they are not suitable for 470ºF.

B. Mechanically Coupled Grooved Joints:
   1. Mechanical coupling connections shall mechanically engage, lock and seal the grooved pipe ends in a positive couple. Each coupling shall consist of malleable iron housing clamps, steel bolts and nuts, and sealing gasket designed so internal pressure tends to increase the tightness of the seal.
   2. Use grooved mechanical couplings and fasteners only in accessible locations.
   3. Final tightening of bolts shall be with a torque wrench for equal tension in all bolts.

C. Mechanical Press Connection:
   1. Copper press fitting shall be made in accordance with the manufacturer's installation instructions.
   2. Fully insert tubing into the fitting and mark tubing.
   3. Prior to making connection, the fitting alignment shall be checked against the mark made on the tube to ensure the tubing is fully engaged in the fitting.
   4. Joint shall be pressed with a tool approved by the manufacturer.
   5. Installers shall be trained by manufacturer personnel or representative. Provide documentation upon request.

D. Mechanical Push-To-Connect:
   1. Copper push-to-connect fittings shall be made in accordance with the manufacturer's installation instructions.
   2. Installers shall be trained by manufacturer personnel or representative. Provide documentation upon request.

E. Mechanical Joints:
   1. Joints shall conform to ANSI A21.11 "Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings". Gasket material shall be neoprene. The standard bolts and nuts of the pipe manufacturer shall be used and shall be coated at the factory with rust preventive lubricant after threading and tapping.
   2. Final tightening of bolts shall be with a torque wrench to insure equal tension in all bolts.

F. Push-On Joints - Pressure Pipe:
   1. Joints shall be single gasket type conforming to ANSI A21.11 "Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings". The bell shall have cast or machined gasket socket recesses, a tapered annular opening and flared socket design to provide deflections up to 5º. Plain spigot ends shall be suitably beveled for easy entry into bell, centering in gasket and compression of gasket.
   2. The joint shall be liquid tight under all pressures from vacuum to 350 psig.
3. Furnish sufficient lubricant for a thin coat on each spigot end. Lubricant shall be non-toxic, impart no taste or odor to conveyed liquid, and have no deleterious effect on the rubber gasket. Lubricant shall be of such consistency that it can be easily applied to the pipe in hot and cold weather and shall adhere to either wet or dry pipe.

G. Compression Gasket Joints - Storm Pipe:

1. Joint shall be one piece double seal compression type gasket made specifically for joining cast iron soil pipe. Gasket shall be neoprene, permitting joint to flex as much as 5 degrees without loss of seal. Gasket shall be extra heavy weight class, conforming to ASTM C-564.

H. Lead and Oakum Joints - Storm Pipe:

1. Pack joint with oakum made of vegetable fiber, cotton, or hemp. Pour joint with molten lead up to top of hub. Ensure leak-free joints by working joint with inside and outside caulking irons.

3.9 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Provide necessary connections at the start of individual sections of mains for adding chlorine.

B. Before starting work, verify system is complete, flushed and clean.

C. Ensure pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.

E. Bleed water from all outlets to ensure chlorine distribution throughout the entire domestic water system.

F. Verify initial chlorination levels by testing at minimum 15% of outlets located throughout entire building, including the last fixture connected to each main and each branch extending over 50 feet from a main.

G. Maintain disinfectant in system for 24 hours, after which test at minimum 15% of outlets located throughout entire building, including the last fixture connected to each main and each branch extending over 50 feet from a main. If final disinfectant residual tests less than 25 mg/L at any one of the tested outlets, flush the entire system and repeat disinfection and testing procedure.

H. After final disinfectant residuals test at or above 25 mg/L after a minimum 24-hour duration, flush disinfectant from system at a minimum velocity of 3.0 feet/second until residual is equal to that of incoming water or 1.0 mg/L.

I. Take water samples, no sooner than 24 hours after flushing, from 2% of outlets and from water entry. Obtain, analyze, and test samples in accordance with AWWA C651, Section 5 - Verification.
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements applicable to all Division 23 Sections. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced in the specification section.

1.2 SCOPE OF WORK

A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.

B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make his portion of the Mechanical Work a finished and working system.

C. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.

D. Scope of Work:

1. Heating Work shall include, but is not necessarily limited to:
   a. Modify existing heating water system including piping and insulation.
   b. Modify existing chilled water system including pumps, piping, insulation, and specialties.
   c. Remove and dispose of oil and refrigerant from existing compressors. Properly abandon existing chillers in place.

2. Air Conditioning and Ventilating Work shall include, but is not necessarily limited to:
   a. Modify existing exhaust ductwork systems including all fittings, insulation, inlets, and fans.
   b. Modify existing mechanical room ventilation systems including louvers, ductwork, insulation, and fans.

3. Temperature Control Work shall include, but is not necessarily limited to:
   a. Extend existing temperature control system as specified in Section 23 09 00.
   b. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.
4. Testing, Adjusting, and Balancing Work shall include, but is not necessarily limited to:

   a. Furnish complete testing, adjusting, and balancing as specified in Section 23 05 93, including, but not limited to, hydronic systems and verification of control systems.

1.3 WORK SEQUENCE

   A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours will be required.

   B. Itemize all work and list associated hours and pay scale for each item.

1.4 ALTERNATES

1.5 UNIT PRICES

1.6 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS

   A. Definitions:

   1. "Mechanical Contractors" refers to the following:

      a. Plumbing Contractor.
      b. Heating Contractor.
      c. Temperature Control Contractor.
      d. Testing, Adjusting, and Balancing Contractor.
      e. Specialty Contractor (as specified in Division 13)

   2. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case the devices are usually single phase and are usually connected to the motor power wiring through a manual motor starter having "Manual-Off-Auto" provisions.

   3. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.

   4. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. Generally, where the motor power wiring exceeds 120 volts, a control transformer is used to give a control voltage of 120 volts.

   5. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring which directly powers or controls a motor used to drive equipment such as fans, pumps, etc.

      a. This wiring will be from a 120 volt source and may continue as 120 volt, or be reduced in voltage (24 volt) in which case a control transformer shall be furnished as part of the temperature control wiring.
6. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.

B. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractor's responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, chillers, compressors and the like. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals reviewed. Therefore, the electrical drawings show only known wiring related to such items. All wiring not shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.

2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall provide complete wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.

3. All electrical work shall conform to the National Electrical Code. All provisions of the Electrical Specifications concerning wiring, protection, etc., apply to wiring provided by the Mechanical Contractor unless noted otherwise.

4. All Contractors shall establish utility elevations prior to fabrication and shall coordinate their material and equipment with other trades. When a conflict arises, priority is as follows:
   a. Light fixtures.
   b. Gravity flow piping, including steam and condensate.
   c. Electrical busduct.
   d. Sheet metal.
   e. Electrical cable trays, including access space.
   f. Sprinkler piping and other piping.
   g. Electrical conduits and wireway.

C. Mechanical Contractor's Responsibility:

1. Assumes all responsibility for the Temperature Control wiring, when the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.

2. Shall verify all existing equipment sizes and capacities where units are to be modified, moved or replaced. Contractor shall notify Architect/Engineer of any discrepancies prior to ordering new units or replacement parts, including replacements of equipment motors.

3. Temperature Control Contractor's Responsibility:

   a. Wiring of all devices needed to make the Temperature Control System functional.

   b. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control Contractor.
c. Coordinating equipment locations (such as relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.

4. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

D. Electrical Contractor's Responsibility:

1. Provides all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor on the Mechanical Drawings or Specifications.

2. Installs and wires all remote control devices furnished by the Mechanical Contractor or Temperature Control Contractor when so noted on the Electrical Drawings.

3. Provides motor control and temperature control wiring, where so noted on the drawings.

4. Coordinate with the Mechanical Contractor for size of motors and/or other electrical devices involved with repair or replacement of existing equipment.

5. Furnishes, installs and connects all relays, etc., for automatic shutdown of certain fans upon actuation of the Fire Alarm System as indicated and specified in Division 28.

6. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.7 COORDINATION DRAWINGS

A. Definitions:

1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.

   a. Mechanical trades shall include, but are not limited to, mechanical equipment, ductwork, plumbing piping, hydronic piping, and any item that may impact coordination with other disciplines.

   b. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" and larger, conduit racks, cable trays, pull boxes, transformers, raceway, busway, lighting, ceiling-mounted devices, and any item that may impact coordination with other disciplines.

   c. Maintenance clearances and code-required dedicated space shall be included.

   d. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.
2. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.

B. Participation:

1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.

2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the Mechanical Contractor.

   a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.

3. Electronic CAD drawings shall be submitted to the Coordinating Contractor for addition of work by other trades. KJWW will provide electronic file copies of ventilation drawings for contractor’s use if the contractor signs and returns an “Electronic File Transfer” waiver provided by KJWW. KJWW will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings.

C. Drawing Requirements:

1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.

   a. Scale of drawings:

      1) General plans: 1/4 Inch = 1'-0" (minimum).

      2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).

      3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).

      4) Sections of shafts and mechanical and electrical equipment rooms: 1/4 Inch = 1 '-0" (minimum).

      5) Sections of congested areas: 1/2 Inch = 1'-0" (minimum).

2. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.

3. The minimum quantity of drawings will be established at the first coordination meeting and sent to the A/E for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.
D. General:

1. Coordination drawing files shall be made available to the A/E and Owner's Representative. The A/E will only review identified conflicts and give an opinion, but will not perform as a coordinator.

2. A plotted set of coordination drawings shall be available at the project site.

3. Coordination drawings are not shop drawings and shall not be submitted as such.

4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in his/her bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.

5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.

6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.

7. The A/E reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.

8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the A/E.

9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.
   a. Access to mechanical, electrical, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.
   b. Potential layout changes shall be made to avoid additional access panels.
   c. Additional access panels shall not be allowed without written approval from the A/E at the coordination drawing stage.
   d. Providing additional access panels shall be considered after other alternatives are reviewed and discarded by the A/E and the Owner's Representative.
   e. When additional access panels are required, they shall be provided without additional cost to the Owner.

10. Complete the coordination drawing process and obtain sign off of the drawings by all contractors prior to installing any of the components.

11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.
12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

1.8 QUALITY ASSURANCE

A. Contractor’s Responsibility Prior to Submitting Pricing Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.

2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor’s own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor’s risk.

B. Qualifications:

1. Only products of reputable manufacturers are acceptable.

2. All Contractors and subcontractors shall employ only workers skilled in their trades.

C. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the City of Champaign, Illinois Codes, Laws, Ordinances and other regulations having jurisdiction.

2. Conform to all published standards of the University of Illinois.

3. Conform to all State Codes.

4. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.

5. If the Contractor notes, at the time of bidding, any parts of the drawings or specifications that do not comply with the codes or regulations, he shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, he shall submit with his proposal a separate price to make the system comply with the codes and regulations.

6. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.

7. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
8. All rotating shafts and/or equipment shall be completely guarded from all contact. Partial guards and/or guards that do not meet all applicable OSHA standards are not acceptable. Contractor is responsible for providing this guarding if it is not provided with the equipment supplied.

D. Permits, Fees, Taxes, Inspections:
   1. Procure all applicable permits and licenses.
   2. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
   3. Pay all charges for permits or licenses.
   4. Pay all fees and taxes imposed by the State, Municipal and/or other regulatory bodies.
   5. Pay all charges arising out of required inspections by an authorized body.
   6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.
   7. Where applicable, all fixtures, equipment and materials shall be approved or listed by Underwriter’s Laboratories, Inc.

E. Utility Company Requirements:
   1. Secure from the appropriate private or public utility company all applicable requirements.
   2. Comply with all utility company requirements.
   3. Make application for and pay for service connections, such as gas.
   4. Make application for and pay for all meters and metering systems required by the utility company.

F. Examination of Drawings:
   1. The drawings for the mechanical work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
   2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.
   3. Scaling of the drawings is not sufficient or accurate for determining these locations.
   4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
   5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of
the specifications or required for proper installation of the work, such items shall be furnished and installed.

6. If an item is either on the drawings or in the specifications, it shall be included in this contract.

7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.

8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.

   a. Any item listed as furnished shall also be installed, unless otherwise noted.

   b. Any item listed as installed shall also be furnished, unless otherwise noted.

G. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any materials or fabricating any supports, pipes or ducts.

H. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing Revit.

2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.

3. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by KJWW.

4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.

5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.

6. The drawings prepared by KJWW for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.

7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.

8. The information is provided to expedite the project and assist the Contractor with no guarantee by KJWW as to the accuracy or correctness of the information provided. KJWW accepts no responsibility or liability for the Contractor's use of these documents.
1.9 SUBMITTALS

A. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals list:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Submittal Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 05 00</td>
<td>Owner Training Agenda</td>
</tr>
<tr>
<td>23 05 03</td>
<td>Fire Seal Systems</td>
</tr>
<tr>
<td>23 05 93</td>
<td>Testing, Adjusting, and Balancing</td>
</tr>
<tr>
<td>23 09 13</td>
<td>Instrumentation</td>
</tr>
<tr>
<td>23 21 00</td>
<td>Hydronic Piping Systems and Valves</td>
</tr>
</tbody>
</table>

B. General Submittal Procedures: In addition to the provisions of Division 1, the following are required:

1. Transmittal: Each transmittal shall include the following:
   a. Date
   b. Project title and number
   c. Contractor’s name and address
   d. Division of work (e.g., plumbing, heating, ventilating, etc.)
   e. Description of items submitted and relevant specification number
   f. Notations of deviations from the contract documents
   g. Other pertinent data

2. Submittal Cover Sheet: Each submittal shall include a cover sheet containing:
   a. Date
   b. Project title and number
   c. Architect/Engineer
   d. Contractor and subcontractors’ names and addresses
   e. Supplier and manufacturer’s names and addresses
   f. Division of work (e.g., plumbing, heating, ventilating, etc.)
   g. Description of item submitted (using project nomenclature) and relevant specification number
   h. Notations of deviations from the contract documents
   i. Other pertinent data
   j. Provide space for Contractor’s review stamps

3. Composition:
   a. Submittals shall be submitted using specification sections and the project nomenclature for each item.
   b. Individual submittal packages shall be prepared for items in each specification section. All items within a single specification section shall be packaged together where possible. An individual submittal may contain items from multiple specifications sections if the items are intimately linked (e.g., pumps and motors).
   c. All sets shall contain an index of the items enclosed with a general topic description on the cover.
4. **Content:** Submittals shall include all fabrication, erection, layout, and setting drawings; manufacturers’ standard drawings; schedules; descriptive literature, catalogs and brochures; performance and test data; wiring and control diagrams; dimensions; shipping and operating weights; shipping splits; service clearances; and all other drawings and descriptive data of materials of construction as may be required to show that the materials, equipment or systems and the location thereof conform to the requirements of the contract documents.

5. **Contractor’s Approval Stamp:**

   a. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. The Contractor shall stamp, date and sign each submittal certifying it has been reviewed.

   b. Unstamped submittals will be rejected.

   c. The Contractor’s review shall include, but not be limited to, verification of the following:

      1) Only approved manufacturers are used.
      2) Addenda items have been incorporated.
      3) Catalog numbers and options match those specified.
      4) Performance data matches that specified.
      5) Electrical characteristics and loads match those specified.
      6) Equipment connection locations, sizes, capacities, etc. have been coordinated with other affected trades.
      7) Dimensions and service clearances are suitable for the intended location.
      8) Equipment dimensions are coordinated with support steel, housekeeping pads, openings, etc.
      9) Constructability issues are resolved (e.g., weights and dimensions are suitable for getting the item into the building and into place, sinks fit into countertops, etc.).

   d. The Contractor shall review, stamp and approve all subcontractors’ submittals as described above.

   e. **The Contractor’s approval stamp is required on all submittals.** Approval will indicate the Contractor’s review of all material and a complete understanding of exactly what is to be furnished. Contractor shall clearly mark all deviations from the contract documents on all submittals. If deviations are not marked by the Contractor, then the item shall be required to meet all drawing and specification requirements.

6. **Submittal Identification and Markings:**

   a. The Contractor shall clearly mark each item with the same nomenclature applied on the drawings or in the specifications.

   b. The Contractor shall clearly indicate the size, finish, material, etc.

   c. Where more than one model is shown on a manufacturer’s sheet, the Contractor shall clearly indicate exactly which item and which data is intended.
d. All marks and identifications on the submittals shall be unambiguous.

7. Schedule submittals to expedite the project. Coordinate submission of related items.

8. Identify variations from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.

9. Reproduction of contract documents alone is not acceptable for submittals.

10. Incomplete submittals will be rejected without review. Partial submittals will only be reviewed with prior approval from the Architect/Engineer.

11. Submittals not required by the contract documents may be returned without review.

12. The Architect/Engineer's responsibility shall be to review one set of shop drawing submittals for each product. If the first submittal is incomplete or does not comply with the drawings and/or specifications, the Contractor shall be responsible to bear the cost for the Architect/Engineer to recheck and handle the additional shop drawing submittals.

13. Submittals shall be reviewed and approved by the Architect/Engineer before releasing any equipment for manufacture or shipment.

14. Contractor's responsibility for errors, omissions or deviation from the contract documents in submittals is not relieved by the Architect/Engineer's approval.

C. Electronic Submittal Procedures:

1. Distribution: Email submittals as attachments to all parties designated by the Architect/Engineer, unless a web-based submittal program is used.

2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.

3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
   a. Submittal file name: 23 XX XX.description.YYYYMMDD
   b. Transmittal file name: 23 XX XX.description.YYYYMMDD

5. File Size: Electronic file size shall be limited to a maximum of 4MB. Larger files shall be transmitted via a pre-approved method.

1.10 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 1.
B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
2. Submit in Excel format.
3. Support values given with substantiating data.

C. Preparation:

1. Itemize the cost for each of the following:
   a. Overhead and profit.
   b. Bonds.
   c. Insurance.
   d. General Requirements: Itemize all requirements.

2. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
   a. Contractor’s own labor forces.
   b. All subcontractors.
   c. All major suppliers of products or equipment.

3. Break down all costs into:
   a. Material: Delivered cost of product with taxes paid.
   b. Labor: Labor cost, excluding overhead and profit.

4. For each line item having an installed cost of more than $5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:
   a. Each piece of equipment requiring shop drawings (e.g., each air handling unit, pump, exhaust fan, etc.). Use the equipment nomenclature (AHU-1, P-1, EF-1, etc.) on the Schedule of Values.
   b. Each type of small unitary equipment (e.g., FCUs, UHs, CABs, etc.). Multiple units of the same type can be listed together, provided quantities are also listed so unit costs can be determined.
   c. Each piping system (chilled water, heating water, steam, condensate, etc.). In addition, for larger projects, break down the material and labor for each piping system based on geography (building, floor, and/or wing).
   d. Each duct system (supply, return, relief, outside air, etc.) listed separately for each unit they serve (AHU-1 supply air ductwork, AHU-1 return air ductwork, etc.).
   e. Pipe insulation with separate material and labor line items for each piping system listed above.
   f. Duct insulation with separate material and labor line items for each duct system listed above.
   g. Temperature controls broken down into material and labor for the following:
      1) Engineering
      2) Controllers, devices, sensors, etc.
      3) Control valves
      4) Control dampers
      5) Conduit
6) Wiring  
7) Programming  
8) Commissioning

h. Site utilities (5' beyond building)  
i. Air balancing  
j. Water balancing  
k. Commissioning  
l. Record drawings  
m. Punchlist and closeout

D. Update Schedule of Values when:
   1. Indicated by Architect/Engineer.  
   2. Change of subcontractor or supplier occurs.  
   3. Change of product or equipment occurs.

1.11 CHANGE ORDERS

A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders with inadequate breakdown will be rejected.

B. Change order work shall not proceed until authorized.

1.12 EQUIPMENT SUPPLIERS’ INSPECTION

A. The following equipment shall not be placed in operation until a competent installation and service representative of the manufacturer has inspected the installation and certified that the equipment is properly installed, adjusted and lubricated; that preliminary operating instructions have been given; and that the equipment is ready for operation:
   1. Air Cooled Condensers (provided by others)  
   2. Base Mounted Pumps (provided by others)  
   3. Fire Seal Systems  
   4. Water Chillers (provided by others)

B. Contractor shall arrange for and obtain supplier's on-site inspection(s) at proper time(s) to assure each phase of equipment installation and/or connection is in accordance with the manufacturer's instructions.

C. Submit copies of start-up reports to the Architect/Engineer and include copies of Owner’s Operation and Maintenance Manuals.

1.13 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage. Keep materials clean, dry and free from harmful conditions. Immediately remove any materials that become wet or that are suspected of becoming contaminated with mold or other organisms.

B. Keep all bearings properly lubricated and all belts properly tensioned and aligned.

C. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Mechanical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and
rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.

D. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate his/her work with other trades.

1.14 WARRANTY

A. Provide one-year warranty, unless otherwise noted, to the Owner for all fixtures, equipment, materials, and workmanship.

B. The warranty period for all work in this Division of the specifications shall commence on the date of final acceptance, unless a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.

C. Warranty requirements shall extend to correction, without cost to the Owner, of all Work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage resulting from defects or nonconformance with contract documents.

1.15 INSURANCE

A. Contractor shall maintain insurance coverage as set forth in Division 0 of these specifications.

1.16 CONTINGENCY

A. The Mechanical Contractors shall include in the Base Bid a contingency of one percent (1%) to be used only by change orders issued by the Architect/Engineer. The unused portion of the contingency shall be deducted from the Contract price before final payment is made.

1.17 MATERIAL SUBSTITUTION

A. Where several manufacturers’ names are given, the manufacturer for which a catalog number is given is the basis for job design and establishes the quality required.

B. Equivalent equipment manufactured by the other named manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications, and fits in the allocated space.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.

D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on his part or on the part of other Contractors whose work is affected.
E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.

F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or his or her employee and subconsultants at a construction site, shall relieve the Contractor and other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and his or her personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer’s consultants shall be indemnified and shall be made additional insureds under the Contractor’s general liability insurance policy.

3.2 ARCHITECT/ENGINEER OBSERVATION OF WORK

A. The Contractor shall provide seven (7) calendar days’ notice to the Architect/Engineer prior to:
   1. Placing fill over underground and underslab utilities.
   2. Covering exterior walls, interior partitions and chases.
   3. Installing hard or suspended ceilings and soffits.

B. The Architect/Engineer will have the opportunity to review the installation and provide a written report noting deficiencies requiring correction. The Contractor’s schedule shall account for these reviews and show them as line items in the approved schedule.

C. Above-Ceiling Final Observation

1. All work above the ceilings must be complete prior to the Architect/Engineer’s review. This includes, but is not limited to:
   a. Pipe insulation is installed and fully sealed.
   b. Pipe and duct wall penetrations are sealed.
   c. Pipe identification and valve tags are installed.
   d. Main, branch and flexible ducts are installed.

2. In order to prevent the Above-Ceiling Final Observation from occurring too early, the Contractor shall review the status of the work and certify, in writing, that the work is ready for the Above-Ceiling Final Observation.
3. It is understood that if the Architect/Engineer finds the ceilings have been installed prior to this review and prior to 7 days elapsing, the Architect/Engineer may not recommend further payments to the contractor until such time as full access has been provided.

3.3 PROJECT CLOSEOUT

A. The following paragraphs supplement the requirements of Division 1.

B. Final Jobsite Observation:

1. In order to prevent the Final Jobsite Observation from occurring too early, the Contractor is required to review the completion status of the project and certify that the job is ready for the final jobsite observation.

2. Attached to the end of this section is a typical list of items that represent the degree of job completeness expected prior to requesting a review.

3. Upon Contractor certification that the project is complete and ready for a final observation, the Contractor shall sign the attached certification and return it to the Architect/Engineer so that the final observation can be scheduled.

4. It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineer’s additional time and expenses will be deducted from the Contractor’s contract retainage prior to final payment at the completion of the job.

C. Before final payment is authorized, this Contractor must submit the following:

1. Operation and maintenance manuals with copies of approved shop drawings.

2. Record documents including marked-up or reproducible drawings and specifications.

3. A report documenting the instructions given to the Owner’s representatives complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of This Contractor and shall be signed by the Owner’s representatives.


5. Start-up reports on all equipment requiring a factory installation inspection or start-up.

6. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site and place in location as directed; receipt by Architect/Engineer required prior to final payment approval.

3.4 OPERATION AND MAINTENANCE MANUALS

A. General:

1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer’s review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer’s comments. Once corrected,
electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.

2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.

2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.

3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.
   a. O&M file name: O&M.div23.contractor.YYYYMMDD
   b. Transmittal file name: O&Mtransmittal.div23.contractor.YYYYMMDD

5. File Size: Electronic file size shall be limited to a maximum of 4MB. Larger files shall be divided into files that are clearly labeled as “1 of 2”, “2 of 2”, etc.

6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title “Operation and Maintenance Instructions”, title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.

7. All text shall be searchable.

8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Paper Copy Submittal Procedures:

1. Once the electronic version of the manuals has been approved by the Architect/Engineer, three (3) paper copies of the O&M manual shall be provided to the Owner. The content of the paper copies shall be identical to the corrected electronic copy.

2. Binder Requirements: The Contractor shall submit three sets of O&M manuals in heavy duty, locking three ring binders. Incorporate clear vinyl sheet sleeves on the front cover and spine for slip-in labeling. “Peel and stick” labels are not acceptable. Sheet lifters shall be supplied at the front of each notebook. The three-ring binders shall be 1/2" thicker than initial material to allow for future
inserts. If more than one notebook is required, label in consecutive order. For example; 1 of 2, 2 of 2. No other form of binding is acceptable.

3. Binder Labels: Label the front and spine of each binder with “Operation and Maintenance Instructions”, title of project, and subject matter.

4. Index Tabs: Divide information by specification section, major equipment, or systems using index tabs. All tab titling shall be clearly printed under reinforced plastic tabs. All equipment shall be labeled to match the identification in the construction documents.

D. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.

2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.

3. Copies of all final approved shop drawings and submittals. Include Architect’s/Engineer’s shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.

4. Refer to Section 23 09 00 for additional requirements for Temperature Control submittals.

5. Copy of final approved test and balance reports.

6. Copies of all factory inspections and/or equipment startup reports.


8. Schematic wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.

9. Dimensional drawings of equipment.

10. Capacities and utility consumption of equipment.

11. Detailed parts lists with lists of suppliers.

12. Operating procedures for each system.

13. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.

14. Repair procedures for major components.

15. List of lubricants in all equipment and recommended frequency of lubrication.

16. Instruction books, cards, and manuals furnished with the equipment.
3.5 INSTRUCTING THE OWNER'S REPRESENTATIVES

A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.

B. Provide verbal and written instructions to the Owner's representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.

C. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.

D. The instructions shall include:

1. Explanation of all system flow diagrams.
2. Explanation of all air handling systems.
3. Temperature control system operation including calibration, adjustment and proper operating conditions of all sensors.
4. Maintenance of equipment.
5. Smoke control systems.
6. Stairwell pressurization systems.
7. Start-up procedures for all major equipment.
8. Explanation of seasonal system changes.
9. Description of emergency system operation.

E. The Architect/Engineer shall be notified of the time and place instructions will be given to the Owner's representatives so he or his representative can attend if desired.

F. Minimum hours of instruction for each item shall be:

1. Chilled Water System - Four (4) hours.
2. Refrigeration System - Four (4) hours.

G. The Contractor shall prepare a detailed, written training agenda and submit it to the Architect/Engineer a minimum of two weeks prior to the formal training for approval. The written agenda shall include specific training points within the items described above. For example: how to adjust setpoints, troubleshooting, proper start-up, proper shut-down, seasonal changes, draining, venting, changing filters, changing belts, etc. Failure to provide and follow an approved training agenda may result in additional training required at the expense of the Contractor.

H. Operating Instructions:

1. Contractor is responsible for all instructions to the Owner's representatives for the mechanical and control systems.

2. If the Contractor does not have staff that can adequately provide the required instructions he shall include in his bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.6 RECORD DOCUMENTS

A. The following paragraph supplements Division 1 requirements:

Contractor shall maintain at the job site a separate and complete set of mechanical drawings and specifications on which he shall clearly and permanently mark in complete detail all changes made to the mechanical systems.
B. Mark drawings to indicate revisions to piping and ductwork, size and location, both exterior and interior; including locations of coils, dampers, other control devices, filters, and other units requiring periodic maintenance or repair; actual equipment locations, dimensioned from column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned from column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (e.g., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices.

C. Refer to Section 23 09 00 for additional requirements for Temperature Control documents.

D. Before completion of the project, a set of reproducible mechanical drawings will be given to the Contractor for transfer of all as-built conditions from the paper set maintained at the job site. All marks on reproducibles shall be clear and permanent.

E. Mark specifications to show approved substitutions; Change Orders, and actual equipment and materials used.

F. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.

G. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

3.7 ADJUST AND CLEAN

A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project. Clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from all equipment.

B. Clean all drain pans and areas where moisture is present. Immediately report any mold, biological growth, or water damage.

C. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.8 SPECIAL REQUIREMENTS

A. Contractor shall coordinate the installation of all equipment, valves, dampers, operators, etc., with other trades to maintain clear access area for servicing.

B. All equipment shall be installed in such a way to maximize access to parts needing service or maintenance. Review the final field location, placement, and orientation of equipment with the Owner's designated representative prior to setting equipment.

C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's designated representative will result in removal and reinstallation of the equipment at the Contractor's expense.

3.9 IAQ MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:
1. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:
   a. Minimizing the amount of dust generated.
   b. Reducing solvent fumes and VOC emissions.
   c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.
   d. Protect stored on-site and installed absorptive materials from moisture damage.

2. Request that the Owner designate an IAQ representative.

3. Review and receive approval from the Owner’s IAQ representative for all IAQ-related construction activities and negative pressure containment plans.

4. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.

5. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner’s IAQ representative during unoccupied periods.

6. Request copies of and follow all of the Owner’s IAQ and infection control policies.

7. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.

8. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.

9. In addition to the criteria above, provide measures as recommended in the SMACNA “IAQ Guidelines for Occupied Buildings Under Construction”.

10. If permanently installed air handlers are used during construction, MERV 8 filtration media must be used to protect each return air grille or opening. The intent of this will be to prevent construction dust and debris from entering any return or supply air ductwork in the facility. All filtration media must be replaced immediately prior to occupancy.

END OF SECTION
READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

In order to prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations fire sealed and labeled in accordance with specifications.
2. All air handling units operating and balanced.
3. All fans shall be operating and balanced.
4. All pumps, boilers and chillers operating and balanced.
5. All miscellaneous mechanical systems (unit heaters, fan coil units, cabinet heaters, etc.) operating.
6. All temperature control systems operating, programmed and calibrated.
7. Pipe insulation complete, pipes labeled and valves tagged.
8. Fire damper and fire/smoke damper access doors labeled in accordance with specifications.

Accepted by:

Prime Contractor ___________________________________________

By ___________________________________  Date __________________

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

* * * * *

* * * * *
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Through-Penetration Firestopping.

1.2 QUALITY ASSURANCE
A. Manufacturer: Company specializing in manufacturing products specified in this Section.
B. Installer: Individuals performing work shall be certified by the manufacturer of the system selected for installation.

1.3 REFERENCES
A. UL 723 - Surface Burning Characteristics of Building Materials
B. ANSI/UL 1479 - Fire Tests of Through Penetration Firestops
C. UL Fire Resistance Directory Through Penetration Firestop Systems (XHEZ)
D. Warnock Hersey - Directory of Listed Products
F. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Firestops
G. The Building Officials and Code Administrators National Building Code
H. 2012 International Building Code
I. NFPA 5000 – Building Construction Safety Code

1.4 SUBMITTALS
A. Submit under provisions of Division 1 and Section 23 05 00.
B. Submit Firestopping Installers Certification for all installers on the project.
C. Shop Drawings: Submit for each condition requiring firestopping. Include descriptions of the specific penetrating item, actual wall/floor construction, manufacturer's installation instructions, and UL or Warnock Hersey Assembly number.
D. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
   1. Types of penetrating items.
   2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
   3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
   4. F and T ratings for each firestop system.
E. Maintain a notebook on the job site at all times that contains copies of approved submittals for all through penetration firestopping to be installed. Notebook shall be made available to the Authority Having Jurisdiction at their request and turned over to the Owner at the end of construction as part of the O&M Manuals.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Store, protect and handle products on site. Accept material on site in factory containers and packing. Inspect for damage. Protect from deterioration or damage due to moisture,
temperature changes, contaminants, or other causes. Follow manufacturer’s instructions for storage.

B. Install material prior to expiration of product shelf life.

1.6 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated walls including fire partitions, fire barriers, and smoke barriers.
2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per UL 1479:

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings:
   a. Floor penetrations located outside wall cavities.
   b. Floor penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to light, traffic, moisture, or physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

E. For through-penetration firestop systems in air plenums, provide products with flame-spread and smoke-developed indexes of less than 25 and 50, respectively, as determined per ASTM E 84.

1.7 MEETINGS

A. Pre-installation meeting: A pre-installation meeting shall be scheduled and shall include the General Contractor, all Subcontractors associated with the installation of systems penetrating fire barriers, Firestopping Manufacturer’s Representative, and the Owner.

1. Review foreseeable methods related to firestopping work.
2. Tour representative areas where firestopping is to be installed; inspect and discuss each type of condition and each type of substrate that will be encountered, and preparation to be performed by other trades.

1.8 WARRANTY

A. Provide one year warranty on parts and labor.
B. Warranty shall cover repair or replacement of firestop systems which fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, general durability, or appear to deteriorate in any manner not clearly specified by the manufacturer as an inherent quality of the material.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers. All firestopping systems installed shall be provided by a single manufacturer.

1. 3M; Fire Protection Produces Division.
2. Hilti, Inc.
3. RectorSeal Corporation, Metacaulk.
4. Tremco; Sealant/Weatherproofing Division.
6. Specified Technologies Inc. (S.T.I.)
7. Spec Seal Firestop Products
8. AD Firebarrier Protection Systems

2.2 THROUGH PENETRATION FIRESTOP SYSTEMS

A. Provide materials and systems classified by or listed by Warnock Hersey to provide firestopping equal to time rating of construction being penetrated.

B. All firestopping materials shall be free of asbestos, lead, PCB’s, and other materials that would require hazardous waste removal.

C. Firestopping shall be flexible to allow for normal penetrating item movement due to expansion and contraction.

D. Firestopping systems for plumbing and wet pipe sprinkler piping shall be moisture resistant.

E. Provide firestopping systems capable of supporting floor loads where systems are exposed to possible floor loading or traffic.

F. Provide firestopping systems allowing continuous insulation for all insulated pipes.

G. Provide firestopping systems classified by UL or listed by Warnock Hersey for penetrations through all fire rated construction. Firestopping systems shall be selected from the UL or listed by Warnock Hersey Fire Resistance Directory Category XHEZ based on substrate construction and penetrating item size and material and shall fall within the range of numbers listed:
1. Concrete or Masonry Floors and Walls - 1 or 2 Hour Rated
   F Rating = Wall/Floor Rating
   T Rating (Walls) = 0 or Wall Rating
   T Rating (Floors) = Floor Rating

<table>
<thead>
<tr>
<th>Penetrating Item</th>
<th>UL System No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Penetrating Item</td>
<td>CAJ 0000-0999*</td>
</tr>
<tr>
<td>Metallic Pipe or Conduit</td>
<td>CAJ 1000-1999</td>
</tr>
<tr>
<td>Electrical Cables</td>
<td>CAJ 3000-3999</td>
</tr>
<tr>
<td>Insulated Pipes</td>
<td>CAJ 5000-5999</td>
</tr>
<tr>
<td>Multiple Penetrations</td>
<td>CAJ 8000-8999</td>
</tr>
</tbody>
</table>

   *Alternate method of firestopping is patching opening to match original rated construction.

H. Any opening in walls or floors not covered by the listed series of numbers shall be coordinated with the firestopping manufacturer.

I. Any openings in floors or walls not described in the UL or listed by Warnock Hersey Fire Resistance Directory, or outlined in manufacturer’s information shall be sealed in a manner agreed upon by the Firestopping Manufacturer, Owner, and the Authority Having Jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Ensure all surfaces that contact seal materials are free of dirt, dust, grease, oil, rust, or loose materials. Clean and repair surfaces as required. Remove laitance and form-release agents from concrete.

B. Ensure substrate and penetrating items have been permanently installed prior to installing firestopping systems. Ensure penetrating items have been properly spaced and have proper clearance prior to installing firestopping systems.

C. Surfaces to which sealing materials are to be installed must meet the selected UL or Warnock Hersey system substrate criteria.

D. Prime substrates where recommended in writing by through-penetration firestop system manufacturer. Confine primer to area of bond.

3.2 INSTALLATION

A. In existing construction, provide firestopping of openings prior to and after installation of penetrating items. Remove any existing coatings on surfaces prior to firestopping installation. Temporary firestopping shall consist of packing openings with fire resistant mineral wool for the full thickness of substrate, or an alternate method approved by the Authority Having Jurisdiction. All openings shall be temporarily firestopped immediately upon their installation and shall remain so until the permanent UL or listed by Warnock Hersey listed firestopping system is installed.

B. Install penetration seal materials in accordance with printed instructions of the UL or Warnock Hersey Fire Resistance Directory and with the manufacturer’s printed application instructions.
C. Install dams as required to properly contain firestopping materials within openings and as required to achieve required fire resistance rating. Remove combustible damming after appropriate curing.

3.3 CLEANING AND PROTECTING

A. Clean excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not cause damage.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

3.4 IDENTIFICATION

A. Provide and install labels adjacent to each firestopping location. Label shall be provided by the firestop system supplier and contain the following information in a contrasting color:

1. The words "Warning - Through Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."

2. Firestop System Supplier; UL or listed by Warnock Hersey system number; date installed; contractor name and phone number; manufacturer’s representative name, address, and phone number.

3.5 INSPECTION

A. All penetrations shall be inspected by the manufacturer’s representative to ensure proper installation.

B. Access to firestop systems shall be maintained for examination by the Authority Having Jurisdiction at their request.

C. Proceed with enclosing through-penetration firestop system with other construction only after inspection reports are issued and firestop installations comply with requirements.

D. The contractor shall allow for visual destructive review of 5% of installed firestop systems (minimum of one) to prove compliance with specifications and manufacturer’s instructions and details. Destructive system removal shall be performed by the contractor and witnessed by the Architect/Engineer and manufacturer’s factory representative. The Architect/Engineer shall have sole discretion of which firestop system installations will be reviewed. The contractor is responsible for all costs associated with this requirement including labor and material for removing and replacing the installed firestop system. If any firestop system is found to not be installed per manufacturer’s specific instructions and details, all firestop systems are subject to destructive review and replacement at the Architect/Engineer’s discretion and the contractor’s expense.

END OF SECTION
SECTION 23 05 05 - HVAC DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

   A. Mechanical demolition.
   B. Cutting and Patching.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

   A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

   A. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK
      AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST
      BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY
      CONDITIONS PRIOR TO SUBMITTING A BID.

   B. Where walls, ceilings, etc., are shown as being removed on general drawings, the
      Contractor shall remove all mechanical equipment, devices, fixtures, piping, ducts,
      systems, etc., from the removed area.

   C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others,
      This Contractor shall remove, store, and replace equipment, devices, fixtures, pipes,
      ducts, systems, etc.

   D. Verify that abandoned utilities serve only abandoned equipment or facilities. Extend
      services to facilities or equipment that shall remain in operation following demolition.

   E. Coordinate work with all other Contractors and the Owner. Schedule removal of
      equipment to avoid conflicts.

   F. This Contractor shall verify all existing equipment sizes and capacities where equipment
      is scheduled to be replaced or modified, prior to ordering new equipment.

   G. Bid submittal shall mean the Contractor has visited the project site and verified existing
      conditions and scope of work.

3.2 PREPARATION

   A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.

   B. Provide temporary connections to maintain existing systems in service during
      construction. When work must be performed on operating equipment, use personnel
      experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

   A. Demolish and extend existing mechanical work under provisions of Division 2 and this
      Section.
B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned ducts and piping to source of supply and/or main lines.

D. Remove exposed abandoned pipes and ducts, including abandoned pipes and ducts above accessible ceilings. Cut ducts flush with walls and floors, cap duct that remains, and patch surfaces. Cut pipes above ceilings, below floors and behind walls. Cap remaining lines. Repair building construction to match original. Remove all clamps, hangers, supports, etc. associated with pipe and duct removal.

E. Disconnect and remove mechanical devices and equipment serving equipment that has been removed.

F. Repair adjacent construction and finishes damaged during demolition and extension work.

G. Maintain access to existing mechanical installations which remain. Modify installation or provide access panels as appropriate.

H. Remove unused sections of supply and return air ductwork back to mains. Patch opening with sheet metal and seal airtight. Patch existing insulation to match existing. Where existing ductwork is to be capped and reused, locate the end cap within 6” of the last branch. End caps shall be 3” pressure class and seal class “A”.

I. Extend existing installations using materials and methods compatible with existing installations, or as specified.

J. Properly reclaim and dispose of all refrigerant in demolished equipment and as required for extension of existing equipment.

3.4 CUTTING AND PATCHING

A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 23 05 29 for additional requirements.

B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.

C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.

D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.

E. Floor slab is post-tensioned. All penetrations shall be x-rayed prior to cutting and/or drilling to avoid any tension cables or utilities encased in floor construction.

F. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes x-ray or similar non-destructive means.

G. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.
3.5 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.

C. MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Hangers, Supports, and Associated Anchors.
B. Equipment Bases and Supports.
C. Sleeves and Seals.
D. Flashing and Sealing of Equipment and Pipe Stacks.
E. Cutting of Openings.
F. Escutcheon Plates and Trim.

1.2 REFERENCES

C. MSS SP-127 – Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, Application

1.3 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish sleeves and hanger inserts to General Contractor for placement into formwork.

PART 2 - PRODUCTS

2.1 HANGER RODS

A. Hanger rods for single rod hangers shall conform to the following:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Hanger Rod Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>3/4&quot;</td>
</tr>
</tbody>
</table>

Column #1: Steel pipe.

B. Rods for double rod hangers may be reduced one size. Minimum rod diameter is 3/4 inches.

C. Hanger rods and accessories used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.

D. All hanger rods, nuts, washers, clevises, etc., in damp areas shall have ASTM A123 hot-dip galvanized finish applied after fabrication. This applies to the following areas:

1. Outdoors

2.2 PIPE HANGERS AND SUPPORTS

A. All pipe hangers, clamps, and supports shall conform to Manufacturers Standardization Society MSS-SP-58 and 127 (where applicable).

B. Oversize all hangers, clamps, and supports on insulated piping to allow insulation and jacket to pass through unbroken. This applies to both hot and cold pipes.
C. On all insulated piping, provide a semi-cylindrical metallic shield and fire resistant vapor barrier jacket.

D. As an alternative to separate pipe insulation insert and saddle, properly sized integral rigid insulation sections may be used for this application.

Acceptable Products:

Cooper/B-Line - Fig. B3380 through B3384
Pipe Shields - A1000, A2000
Erico - Model 124, 127

E. Support and laterally brace vertical pipes at every floor level in multi-story structures, and more frequently when required by applicable codes (the Illinois Plumbing Code requires 10 foot maximum spacing for support of copper risers), but never at intervals over 15 feet. Support vertical pipes with riser clamps installed below hubs, couplings or lugs. Provide sufficient flexibility to accommodate expansion and contraction without compromising fire barrier penetrations and other fixed take-off locations.

Acceptable Products:

Anvil - Fig. CT121
Cooper/B-Line - Fig. B3373CT
Erico - Model 510
Nibco/Tolco - Fig. 82

F. Place restrained neoprene mounts beneath vertical pipe riser clamps to prevent sweating of cold pipes. Insulate over mounts.

Acceptable Products: Mason RBA, RCA, or BR.

G. Unless otherwise indicated, hangers shall be as follows:

1. **Clevis Type:**
   Service: Insulated Cold Pipe
   Acceptable Products: Bare Steel, Plastic or Insulated Pipe  Bare Copper Pipe
   
<table>
<thead>
<tr>
<th></th>
<th>Bare Steel, Plastic or Insulated Pipe</th>
<th>Bare Copper Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anvil</td>
<td>Fig. 260</td>
<td></td>
</tr>
<tr>
<td>Cooper/B-Line</td>
<td>Fig. 3100</td>
<td>Fig. B3100C</td>
</tr>
<tr>
<td>Erico</td>
<td>Model 400</td>
<td></td>
</tr>
<tr>
<td>Nibco/Tolco</td>
<td>Fig. 1</td>
<td>Fig. 81PVC</td>
</tr>
</tbody>
</table>

A. Unless otherwise indicated, hangers shall be as follows:

1. **Roller Type:**
   Service: Insulated Glycol Pipe - 4 inches and Larger
   Acceptable Products: 4" through 6"  8" and Above
   
<table>
<thead>
<tr>
<th></th>
<th>4&quot; through 6&quot;</th>
<th>8&quot; and Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anvil</td>
<td>Fig. 181, 271</td>
<td>Fig. 171, 271</td>
</tr>
<tr>
<td>Cooper/B-Line</td>
<td>Fig. 3110, 3117</td>
<td>Fig. 3114, 3117</td>
</tr>
<tr>
<td>Erico</td>
<td>Model 610</td>
<td>Model 605</td>
</tr>
<tr>
<td>Nibco/Tolco</td>
<td>Fig. 324, 327</td>
<td>Fig. 322, 327</td>
</tr>
</tbody>
</table>

B. Support may be fabricated from U-Channel strut or similar shapes. Strut shall be independently supported from hanger drops or building structure. Size and support shall be per manufacturer's installation requirements for structural support of piping. Clamps shall not interrupt piping insulation.
1. Strut used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.

2. Strut used in damp areas listed in hanger rods shall have ASTM A123 hot-dip galvanized finish applied after fabrication.

C. Unless otherwise indicated, pipe supports for use with struts shall be as follows:

1. **Clamp Type:**
   - **Service:** Insulated Cold Pipe
     - Pipes subject to expansion and contraction shall have clamps slightly oversized to allow limited pipe movement.

<table>
<thead>
<tr>
<th>Acceptable Products</th>
<th>Insulated Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unistrut</td>
<td>Fig. P1100 or P2500</td>
</tr>
<tr>
<td>Cooper/B-Line</td>
<td>Fig. B2000 or B2400</td>
</tr>
<tr>
<td>Nibco/Tolco</td>
<td>Fig. A-14 or 2STR</td>
</tr>
</tbody>
</table>

D. Unless otherwise shown, upper attachments for hanger rods or support struts shall be as follows:

1. **Concrete Inserts, Single Rod Galvanized:**
   - Acceptable Products:
     - Anvil Fig. 282
     - Cooper/B-Line Fig. B3014
     - Erico Model 355
     - Nibco/Tolco Fig. 310

2. **Concrete Inserts, Continuous Strip Galvanized:**
   - Acceptable Products:
     - Unistrut Corp P3200 Series
     - Cooper/B-Line Fig. B22-J
     - Erico CONCT

3. **Concrete Anchors:** Fasten to concrete using cast-in or post-installed anchors designed per the requirements of Appendix D of ACI 318-08. Post-installed anchors shall be qualified for use in cracked concrete by ACI-355.2.

4. **Masonry Anchors:** Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

E. Wall supports shall be used where vertical height of structure exceeds minimum spacing requirements. Install wall supports at same spacing as hangers or strut supports along vertical length of pipe runs.

F. **Welding:**

1. Unless otherwise noted, hangers, clips, and auxiliary support steel may be welded in lieu of bolting, clamping, or riveting to the building structural frame.
Take adequate precautions during all welding operations for fire prevention and for protecting walls and ceilings from being damaged by smoke.

2.3 OPENINGS IN FLOORS, WALLS AND CEILINGS

A. Exact locations of all openings for the installation of materials shall be determined by the Contractor and given to the General Contractor for installation or construction as the structure is built.

B. Coordinate all openings with other Contractors.

C. Hire the proper tradesman and furnish all labor, material and equipment to cut openings in or through existing structures, or openings in new structures that were not installed, or additional openings. Repair all spalling and damage to the satisfaction of the Architect/Engineer. Make saw cuts before breaking out concrete to ensure even and uniform opening edges.

D. Said cutting shall be at the complete expense of each Contractor. Failure to coordinate openings with other Contractors shall not exempt the Contractor from providing openings at his expense.

E. Do not cut structural members without written approval of the Architect or Structural Engineer.

2.4 ROOF PENETRATIONS

A. Seal pipes with surface temperature below 150°F penetrating single-ply roofs with conical stepped pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots. Material shall match roofing membrane.

B. Do not break insulation at the clamp. Seal outdoor insulation edges watertight.

2.5 SLEEVES AND LINTELS

A. Each Contractor shall provide sleeves and lintels for all duct and pipe openings required for the Contractor's work in masonry walls and floors, unless specifically shown as being by others.

B. Fabricate all sleeves from standard weight black steel pipe or as indicated on the drawings. Provide continuous sleeve. Cut or split sleeves are not acceptable.

C. Fabricate all lintels for masonry walls from structural steel shapes or as indicated on the drawings. Have all lintels approved by the Architect or Structural Engineer.

D. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.

E. Sleeves shall not penetrate structural members or masonry walls without approval from the Structural Engineer. Sleeves shall then comply with the Architect/Engineer's design.

F. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.

G. Install all sleeves concentric with pipes. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.
H. Where pipes rise through concrete floors that are on earthen grade, provide 3/4" resilient expansion joint material (asphalt and cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.

I. Size sleeves large enough to allow expansion and contraction movement. Provide continuous insulation wrapping.

J. Wall Seals ("Link-Seals"):

1. Where shown on the drawings, pipes passing through walls, ceilings, or floors shall have their annular space (sleeve or drilled hole - not tapered hole made with knockout plug) sealed by properly sized sealing elements consisting of a synthetic rubber material compounded to resist aging, ozone, sunlight, water and chemical action.

2. Sleeves, if used, shall be standard weight steel with primed finish and waterstop/anchor continuously welded to sleeve. If piping carries only fluids below 120°F, sleeves may be thermoplastic with integral water seal and textured surface.

3. Sleeves shall be at least 2 pipe sizes larger than the pipes.

4. Pressure shall be maintained by stainless steel bolts and other parts. Pressure plates may be of composite material for Models S and OS.

5. Sealing element shall be as follows:

<table>
<thead>
<tr>
<th>Model</th>
<th>Service</th>
<th>Element Material</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Standard (Stainless)</td>
<td>EPDM</td>
<td>-40°F to 250°F</td>
</tr>
<tr>
<td>T</td>
<td>Fire Seals (1 hour)</td>
<td>Silicone</td>
<td>-67°F to 400°F</td>
</tr>
<tr>
<td>FS</td>
<td>Fire Seals (3 hours)</td>
<td>Silicone</td>
<td>-67°F to 400°F</td>
</tr>
<tr>
<td>OS</td>
<td>Oil Resistant/Stainless</td>
<td>Nitrile</td>
<td>-40°F to 210°F</td>
</tr>
</tbody>
</table>


2.6 ESCUTCHEON PLATES AND TRIM

A. Fit escutcheons to all insulated or uninsulated exposed pipes passing through walls, floors, or ceilings of finished rooms.

B. Escutcheons shall be heavy gauge, cold rolled steel, copper coated under a chromium plated finish, heavy spring clip, rigid hinge and latch.

C. Install galvanized steel (unless otherwise indicated) trim strip to cover vacant space and raw construction edges of all rectangular openings in finished rooms. This includes pipe openings.

2.7 PIPE PENETRATIONS

A. Seal all pipe penetrations. Seal non-rated walls and floor penetrations with grout or caulk. Backing material may be used.

B. Seal fire rated wall and floor penetrations with fire seal system as specified.
2.8 PIPE ANCHORS

A. Provide all items needed to allow adequate expansion and contraction of all piping. All piping shall be supported, guided, aligned, and anchored as required.

B. Repair all piping leaks and associated damage. Pipes shall not rub on any part of the building.

2.9 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 HVAC SUPPORTS AND ANCHORS

A. General Installation Requirements:

1. Install all items per manufacturer's instructions.

2. Coordinate the location and method of support of piping systems with all installations under other Divisions and Sections of the Specifications.

3. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

B. Supports Requirements:

1. Install roof pipe supports to resist wind movement per manufacturer's recommendations. Method of securing base to roof shall be compatible with roofing materials.

2. Where building structural steel is fireproofed, all hangers, clamps, auxiliary steel, etc., which attach to it shall be installed prior to application of fireproofing. Repair all fireproofing damaged during pipe installation.

3. Set all concrete inserts in place before pouring concrete.

4. Furnish, install and prime all auxiliary structural steel for support of piping systems that are not shown on the Drawings as being by others.

5. Install hangers and supports complete with lock nuts, clamps, rods, bolts, couplings, swivels, inserts and required accessories.

6. Hangers for horizontal piping shall have adequate means of vertical adjustment for alignment.

C. Pipe Requirements:

1. Support all piping and equipment, including valves, strainers, traps and other specialties and accessories to avoid objectionable or excessive stress, deflection, swaying, sagging or vibration in the piping or building structure during erection, cleaning, testing and normal operation of the systems.

2. Do not, however, restrain piping to cause it to snake or buckle between supports.
or to prevent proper movement due to expansion and contraction.

3. Support piping at equipment and valves so they can be disconnected and removed without further supporting the piping.

4. Piping shall not introduce strains or distortion to connected equipment.

5. Parallel horizontal pipes may be supported on trapeze hangers made of structural shapes and hanger rods; otherwise, pipes shall be supported with individual hangers.

6. Trapeze hangers may be used where ducts interfere with normal pipe hanging.

7. Provide additional supports where pipe changes direction, adjacent to flanged valves and strainers, at equipment connections and heavy fittings.

8. Provide at least one hanger adjacent to each joint in grooved end steel pipe with mechanical couplings.

D. Provided the installation complies with all loading requirements of truss and joist manufacturers, the following practices are acceptable:

1. Loads of 100 lbs. or less may be attached anywhere along the top or bottom chords of trusses or joists with a minimum 3’ spacing between loads.

2. Loads greater than 100 lbs. must be hung concentrically and may be hung from top or bottom chord, provided one of the following conditions is met:
   a. The hanger is attached within 6” from a web/chord joint.
   b. Additional L2x2x1/4 web reinforcement is installed per manufacturer’s requirements.

3. It is prohibited to cantilever a load using an angle or other structural component that is attached to a truss or joist in such a fashion that a torsional force is applied to that structural member.

4. If conditions cannot be met, coordinate installation with truss or joist manufacturer and contact Architect/Engineer.

E. Do not exceed 25 lbs. per hanger and a minimum spacing of 2’-0” on center when attaching to metal roof decking (limitation not required with concrete on metal deck). This 25 lbs. load and 2’-0” spacing include adjacent electrical and architectural items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

F. Do not exceed the manufacturer's recommended maximum load for any hanger or support.
G. Spacing of Hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:

<table>
<thead>
<tr>
<th>Pipe Material</th>
<th>Maximum Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Steel (Std. Weight or Heavier – Liquid Service):</td>
<td></td>
</tr>
<tr>
<td>4” &amp; larger</td>
<td>12’-0”</td>
</tr>
<tr>
<td>2. Installation of hangers shall conform to MSS SP-58 and the applicable Plumbing Code.</td>
<td></td>
</tr>
</tbody>
</table>

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Identification of products installed under Division 23.

1.2 REFERENCES
   B. ASTM D-1248 for Polyethylene Extrusion Materials, ICEA S-70-547 Weatherproof Resistant Polyethylene Conductors, ICEA S-61-402/NEMA WC5 Thermoplastic Insulated Wire & Cable, ICEA S-95-658/NEMA WC70 Non-Shielded 0 – 2kV Cables.
   C. UL 1581 Standard for Electrical Wires, Cables, and Flexible Cords.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

2.2 MATERIALS
   A. All pipe markers (purchased or stenciled) shall conform to ANSI A13.1. Marker lengths and letter sizes shall be at least the following:

<table>
<thead>
<tr>
<th>O.D. of Pipe or insulation</th>
<th>Marker Length</th>
<th>Size of Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1/2&quot; to 6&quot;</td>
<td>12&quot;</td>
<td>1-1/4&quot;</td>
</tr>
</tbody>
</table>

   Plastic tags may be used for outside diameters under 3/4".
   B. Plastic Nameplates: Laminated three-layer phenolic with engraved black, 1/4" minimum letters on light contrasting background.
   C. Aluminum Nameplates: Black enamel background with natural aluminum border and engraved letters furnished with two mounting holes and screws.
   D. Plastic Tags: Minimum 1-1/2" square or round laminated three-layer phenolic with engraved, 1/4" minimum black letters on light contrasting background.
   E. Vinyl Pipe Markers: Colored vinyl with permanent pressure sensitive adhesive backing.

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Install all products per manufacturer’s recommendations.
   B. Degrease and clean surfaces to receive adhesive for identification materials.
C. Valves:

1. All valves (except shutoff valves at equipment) shall have numbered tags.

2. Provide or replace numbered tags on all existing valves that are connected to new systems or that have been revised.

3. Provide all existing valves used to extend utilities to this project with numbered tags. Review tag numbering sequence with the Owner prior to ordering tags.

4. Secure tags with heavy duty key chain and brass "S" link or with mechanically fastened plastic straps.

5. Attach to handwheel or around valve stem. On lever operated valves, drill the lever to attach tags.

6. Number all tags and show the service of the pipe.

7. Provide two sets of laminated 8-1/2" x 11" copies of a valve directory listing all valves, with respective tag numbers, uses, and locations. The directory shall be reviewed by the Owner and Architect/Engineer prior to laminating final copies. Laminated copies shall have brass eyelet in at least one corner for easy hanging.

D. Pipe Markers:

1. Adhesive Backed Markers: Use Brady Style 1, 2, or 3 on pipes 3" diameter and larger. Use Brady Style 4, 6, or 8 on pipes under 3" diameter. Similar styles by other listed manufacturers are acceptable. Secure all markers at both ends with a wrap of pressure sensitive tape completely around the pipe.

2. Apply markers and arrows in the following locations where clearly visible:
   a. At each valve.
   b. On both sides of walls that pipes penetrate.
   c. At least every 20 feet along all pipes.
   d. On each riser and each leg of each "T" joint.
   e. At least once in every room and each story traversed.

E. Equipment:

1. All equipment not easily identifiable such as controls, relays, gauges, etc.; and all equipment in an area remote from its function such as air handling units, exhaust fans, filters, reheat coils, dampers, etc.; shall have nameplates or plastic tags listing name, function, and drawing symbol. Do not label exposed equipment in public areas.

2. Fasten nameplates or plastic tags with stainless steel self-tapping screws or permanently bonding cement.

3. Mechanical equipment that is not covered by the U.S. National Appliance Energy Conservation Act (NAECA) of 1987 shall carry a permanent label installed by the manufacturer stating that the equipment complies with the requirements of ASHRAE 90.1.
F. Miscellaneous:

1. Attach self-adhesive vinyl labels at all duct access doors used to reset fusible links or actuators on fire, fire/smoke, or smoke dampers. Lettering shall be a minimum of 1/2" high. Labels shall indicate damper type.

2. Provide engraved plastic tags at all hydronic or steam system make-up water meters.

3.2 SCHEDULE

A. Pipes to be marked:

<table>
<thead>
<tr>
<th>Pipe Service</th>
<th>Lettering Color</th>
<th>Background Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycol Water Supply</td>
<td>White</td>
<td>Green</td>
</tr>
<tr>
<td>Glycol Water Return</td>
<td>White</td>
<td>Green</td>
</tr>
<tr>
<td>Refrigerant (Liquid, Suction or Hot Gas)</td>
<td>Black</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Testing, adjusting, and balancing of cooling systems.
B. Measurement of final operating condition of HVAC systems.

1.2 QUALITY ASSURANCE
A. Agency shall be a company specializing in the adjusting and balancing of systems specified in this section with minimum three years experience. Perform work under supervision of AABC Certified Test and Balance Engineer, NEBB Certified Testing, Balancing and Adjusting Supervisor, SMARTA Certified Air and Hydronic Balancer, or TABB Certified Supervisor.
B. Work shall be performed in accordance with the requirements of the references listed at the start of this section.

1.3 REFERENCES
B. ADC – Test Code for Grilles, Registers, and Diffusers.
D. ASHRAE - 2003 HVAC Applications Handbook; Chapter 37, Testing, Adjusting and Balancing.

1.4 SUBMITTALS
A. Submit copies of report forms, balancing procedures, and the name and qualifications of testing and balancing agency for approval within 30 days after award of Contract.
B. Submit electronic certified copies of test reports to the Architect/Engineer for approval. Include index page and indexing tabs.

1.5 REPORT FORMS
A. Submit reports on AABC, SMACNA or NEBB forms. Use custom forms approved by the Architect/Engineer when needed to supply specified information.
B. Include in the final report a schematic drawing showing each system component, including balancing devices, for each system. Each drawing shall be included with the test reports required for that system. The schematic drawings shall identify all testing points and cross-reference these points to the report forms and procedures.
C. Refer to PART 4 for required reports.

1.6 WARRANTY/GUARANTEE

A. The TAB Contractor shall include an extended warranty of 90 days after owner receipt of a completed balancing report, during which time the Owner may request a recheck of terminals, or resetting of any outlet, coil, or device listed in the test report. This warranty shall provide a minimum of 24 manhours of on site service time. If it is determined that the new test results are not within the design criteria, the balancer shall rebalance the system according to design criteria.

B. Warranty/Guarantee must meet one of the following programs: TABB International Quality Assurance Program, AABC National Project Performance Guarantee, NEBB’s Conformance Certification.

1.7 SCHEDULING

A. Coordinate schedule with other trades. Provide a minimum of seven days notice to all trades and the Architect/Engineer prior to performing each test.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. All procedures must conform to a published standard listed in the References article of this section. All equipment shall be adjusted in accordance with the manufacturer’s recommendations. Any system not listed in this specification but installed under the contract documents shall be balanced using a procedure from a published standard listed in the References article.

B. Recorded data shall represent actual measured or observed conditions.

C. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing is complete, close probe holes and patch insulation with new materials as specified. Restore vapor barrier and finish as specified.

D. Permanently mark setting of valves, dampers, and other adjustment devices allowing for settings to be restored. Set and lock memory stops.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, plugging test holes, and restoring thermostats to specified settings.

F. Installations with systems consisting of multiple components shall be balanced with all system components operating.
3.2 EXAMINATION

A. Before beginning work, verify that systems are complete and operable. Ensure the following:

1. General Equipment Requirements:
   a. Equipment is safe to operate and in normal condition.
   b. Equipment with moving parts is properly lubricated.
   c. Temperature control systems are complete and operable.
   d. Proper thermal overload protection is in place for electrical equipment.
   e. Direction of rotation of all pumps is correct.
   f. Access doors are closed and end caps are in place.

2. Pipe System Requirements:
   a. Coil fins have been cleaned and combed.
   b. Hydronic systems have been cleaned, filled, and vented.
   c. Strainer screens are clean and in place.
   d. Shutoff, throttling and balancing valves are open.

B. Report any defects or deficiencies to Architect/Engineer.

C. Promptly report items that are abnormal or prevent proper balancing.

D. If, for design reasons, system cannot be properly balanced, report as soon as observed.

E. Beginning of work means acceptance of existing conditions.

3.3 PREPARATION

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to the Architect/Engineer for spot checks during testing.

B. Instruments shall be calibrated within six months of testing performed for project, or more recently if recommended by the instrument manufacturer.

3.4 INSTALLATION TOLERANCES

A. ± 10% of scheduled values:

1. Adjust piping systems to ± 10% of design values.

3.5 ADJUSTING

A. After adjustment, take measurements to verify balance has not been disrupted or that disruption has been rectified.

B. After testing, adjusting and balancing are complete, operate each system and randomly check measurements to verify system is operating as reported in the report. Document any discrepancies.

C. Contractor responsible for each motor shall also be responsible for replacement sheaves. Coordinate with contractor.

D. Contractor responsible for pump shall trim impeller to final duty point as instructed by this contractor on all pumps not driven by a VFD. Coordinate with contractor.
3.6 SYSTEM PERFORMANCE REPORT

A. After the conclusion of balancing operations, utilize the building DDC system or install portable data loggers to simultaneously record temperatures and humidity during summer and winter conditions for a seven-day period, continuous over a weekend, and including at least one period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition and within 10°F dry bulb temperature of minimum winter design condition.

B. Design Conditions:

1. Summer: 95°F DB 78°F WB
2. Winter: -15°F DB

C. Architect/Engineer will direct all test locations.

D. Report of test results shall include original recording and three reproductions.

3.7 SUBMISSION OF REPORTS

A. Fill in test results on appropriate forms.

PART 4 - SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED

4.1 GENERAL REQUIREMENTS

A. Title Page:

1. Project name.
2. Project location.
4. Project Engineer (KJWW Engineering Consultants).
5. Project General Contractor.
6. TAB Company name, address, phone number.
7. TAB Supervisor's name and certification number.
8. TAB Supervisor's signature and date.

B. Report Index

C. General Information:

1. Test conditions.
2. Nomenclature used throughout report.
3. Notable system characteristics/discrepancies from design.
4. Test standards followed.
5. Any deficiencies noted.

D. Instrument List:

1. Instrument.
2. Manufacturer, model, and serial number.
3. Range.
4. Calibration date.
4.2 COOLING SYSTEMS

A. Pump Data:

1. General Requirements:
   a. Drawing symbol.
   b. Service.
   c. Manufacturer, size, and model.
   d. Impeller size: specified, actual, and final (if trimmed).

2. Flow Rate:
   a. Flow Rate (gpm): specified and actual.

3. Pressure Drop and Pressure:
   a. Pump Head: specified, operating and shutoff.
   b. Suction Pressure: Operating and shutoff.
   c. Discharge Pressure: Operating and shutoff.

B. Electric Motors:

1. Drawing symbol of equipment served.
2. Manufacturer, Model, Frame.
3. Nameplate: HP, phase, service factor, RPM, operating amps, efficiency.
4. Measured: Amps for each phase.

C. Air Cooled Chillers:

1. General Requirements:
   a. Drawing symbol.
   b. Manufacturer and model.
   c. Refrigerant type and capacity.
   d. Starter type, size, and thermal protection.
   e. Capacity: specified and actual.

2. Temperature:
   a. Evaporator entering water temperature: specified and actual.
   b. Evaporator leaving water temperature: specified and actual.
   c. Condenser entering air temperature.
   d. Condenser leaving air temperature.

3. Pressure Drop and Pressure:
   a. Evaporator pressure drop: specified and actual.

4. Flow Rate:
   a. Evaporator water flow rate: specified and actual.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping Insulation.
B. Insulation Jackets.

1.2 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with five years minimum experience.

B. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, or UL 723 (where required).

C. In accordance with LEED EQc4.1, Low-Emitting Materials - Adhesives and Sealants, all adhesives and sealants used on the interior of the building must comply with the following requirements:
   1. Adhesives, sealants and sealant primers must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

1.3 REFERENCES

C. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
F. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.
G. ASTM B209 - Aluminum and Aluminum-alloy Sheet and Plate.
I. ASTM C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Insulation.
J. ASTM C578 - Preformed Cellular Polystyrene Thermal Insulation.
M. UL 723 - Surface Burning Characteristics of Building Materials.

PART 2 - PRODUCTS

2.1 INSULATION

A. Type B: Elastomeric cellular foam; ANSI/ASTM C534; flexible plastic; 0.27 maximum 'K' value at 75°F, 25/50 flame spread/smoke developed rating when tested in accordance with ASTM E84 (UL 723). Maximum 3/4" thick per layer where multiple layers are specified.

B. Type C: Molded rigid cellular glass; ANSI/ASTM C-552; 0.35 maximum 'K' value at 75°F; moisture resistant, non-combustible; suitable for -100°F to +900°F. For below grade installations use asphaltic mastic paper vapor barrier jacket. Use self-seal all-purpose white kraft jacket for above grade installations.

C. Type J: Preformed rigid cellular polyisocyanurate insulation; ANSI/ASTM C591; maximum 'K' value of 0.19 at 75°F; moisture resistant; suitable for -297°F to +300°F.

2.2 VAPOR BARRIER JACKETS


B. Polyvinylidene Chloride (PVDC or Saran) film and tape: Durable and highly moisture and moisture vapor resistant. Please refer to manufacturer’s recommended installation guidelines.

2.3 JACKET COVERINGS

A. Aluminum Jackets: ASTM B209; 0.016" thick; stucco embossed finish with Z edge seams and aluminum bands for outdoor use. Where colored jacket covers are called for, provide factory-applied hard film acrylic paint in color selected by Architect.

B. Plastic Jackets and Fitting Covers: High impact, glossy white, 0.030" thick, self-extinguishing plastic. Suitable for use indoors or outdoors with ultraviolet inhibitors. Suitable for -40°F to 150°F. 25/50 maximum flame spread/smoke developed.

2.4 REFRIGERANT PIPE COUPLING

A. Insulation Coupling: Molded thermoplastic ASTM D1525, -65°F to 275°F, sizes up to 4-1/8" O.D., and receive insulation thickness up to 1”. Suitable for use indoors or outdoors with UV stabilizers.

B. Acceptable Manufacturers: Klo-Shure or equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install insulation after piping has been tested. Pipe shall be clean, dry and free of rust before applying insulation.
3.2 INSTALLATION

A. General Installation Requirements:

1. Install materials per manufacturer's instructions, building codes and industry standards.

2. Continue insulation with vapor barrier through penetrations. This applies to all insulated piping. Maintain fire rating of all penetrations.

3. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. The insert shall be suitable for planned temperatures, be suitable for use with specific pipe material, and shall be a 180° cylindrical segment the same length as metal shields. Inserts shall be a cellular glass (for all temperature ranges) or molded hydrous calcium silicate (for pipe with operating temperatures above 70°F, with a minimum compressive strength of 50 psi. Polyisocyanurate insulation with a minimum compressive strength of 24 psi is acceptable for pipe sizes 3" and below, minimum 60 psi for pipe sizes 4", and operate below 300°F. Factory fabricated inserts may be used. Rectangular blocks, plugs, or wood material are not acceptable. Temporary wood blocking may be used by the Piping Contractor for proper height; however, these must be removed and replaced with proper inserts by the Insulation Contractor.

4. Neatly finish insulation at supports, protrusions, and interruptions.

5. Install metal shields between all hangers or supports and the pipe insulation. Shields shall be galvanized sheet metal, half-round with flared edges. Adhere shields to insulation. On cold piping, seal the shields vapor-tight to the insulation as required to maintain the vapor barrier, or add separate vapor barrier jacket.

6. Shields shall be at least the following lengths and gauges:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Shield Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot; to 3&quot;</td>
<td>12&quot; long x 18 gauge</td>
</tr>
<tr>
<td>4&quot;</td>
<td>12&quot; long x 16 gauge</td>
</tr>
<tr>
<td>5&quot; to 6&quot;</td>
<td>18&quot; long x 16 gauge</td>
</tr>
</tbody>
</table>

7. All piping and insulation that does not meet 25/50 that is located in an air plenum shall have written approval from the Authority Having Jurisdiction and the local fire department for authorization and materials approval. If approval has been allowed, the non-rated material shall be wrapped with a product that has passed ASTM E84 and/or NFPA 255 testing with a rating of 25/50 or below.

B. Insulated Piping Operating Below 60°F:

1. Insulate fittings, valves, unions, flanges, strainers, flexible connections, flexible hoses, and expansion joints. Seal all penetrations of vapor barrier.

2. On piping operating below 60°F in locations that are not mechanically cooled (e.g., penthouses, mechanical rooms, tunnels, chases at exterior walls, etc.), Type B insulation shall be used.

3. All balance valves with fluid operating below 60°F shall be insulated with a removable plug wrapped with vapor barrier tape to allow reading and adjusting of the valve.
C. Exposed Piping:
   1. Locate and cover seams in least visible locations.
   2. Where exposed insulated piping extends above the floor, provide a sheet metal guard around the insulation extending 12” above the floor. Guard shall be 0.016” cylindrical smooth or stucco aluminum and shall fit tightly to the insulation.

3.3 INSULATION

A. Type B Insulation:
   1. Elastomeric Cellular Foam: Where possible, slip insulation over the open end of pipe without slitting. Seal all butt ends, longitudinal seams, and fittings with adhesive. At elbows and tees, use mitered connections. Do not compress or crush insulation at cemented joints. Joints shall be sealed completely and not pucker or wrinkle. Paint the outside of outdoor insulation with two coats of latex enamel paint recommended by the manufacturer.
   2. Self-seal insulation may be used on pipes operating below 170ºF.

B. Type C Insulation:
   1. Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner.
   2. Insulate fittings with prefabricated fittings.

C. Type J Insulation:
   1. Indoors, above grade or below grade, Polyvinylidene chloride (PVDC or Saran) vapor retarder film and tape: Seal all longitudinal joints with manufacturer approved adhesive. Secure butt joint strips in a similar manner. Refer to manufacturer’s recommendations for installation guidelines.
   2. Insulate pipe fittings with prefabricated insulation fittings.

3.4 JACKET COVER INSTALLATION

A. Metal Covering:
   1. Provide vapor barrier as specified for insulation type. Cover with aluminum jacket covering with seams located on the bottom of horizontal piping. Include fittings, joints and valves.
   2. Seal all interior and exterior butt joints with metal draw bands and sealant. Seal all exterior joints watertight.
   3. Interior joints do not need to be sealed.
4. Use metal covering on the following pipes:
   a. All exterior piping.

B. Plastic Covering:

   1. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.
   2. Solvent weld all joints with manufacturer recommended cement.
   3. Overlap all laps and butt joints 1-1/2” minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.
   4. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1” on circumferential and 1.5” to 2” on longitudinal seams.
   5. Use plastic insulation covering on all exposed pipes including, but not limited to:
      a. All interior piping.
   6. Elastomeric piping insulation may have two coats of latex paint instead of plastic jacket.

3.5 SCHEDULE

<table>
<thead>
<tr>
<th>Piping System</th>
<th>Insulation Type/Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Glycol/Water Supply &amp; Return</td>
<td>B / 1” OR J / 1”</td>
</tr>
<tr>
<td>Up to 1-1/2”</td>
<td>(2 layers of 1/2”)</td>
</tr>
<tr>
<td>2” through 6”</td>
<td>B / 1-1/2” OR J / 1-1/2”</td>
</tr>
<tr>
<td></td>
<td>(2 layers of 3/4”)</td>
</tr>
<tr>
<td>B. Refrig. Hot Gas Lines</td>
<td>B / 1/2”</td>
</tr>
<tr>
<td>Up to 1-1/4”</td>
<td>B / 1”</td>
</tr>
<tr>
<td>1-1/2” and up</td>
<td>(2 layers of 1/2”)</td>
</tr>
<tr>
<td>C. Low Temp. Refrigeration Suction Lines</td>
<td>C / 1-1/2” OR J / 1-1/2”</td>
</tr>
<tr>
<td>(25ºF to 0ºF)</td>
<td>C / 2”</td>
</tr>
<tr>
<td>1/2” thru 1” pipe size</td>
<td>OR J / 2”</td>
</tr>
<tr>
<td>1-1/4” thru 5” pipe size</td>
<td></td>
</tr>
<tr>
<td>D. Insulation Inserts at hangers</td>
<td>C or J - Match pipe insulation thickness</td>
</tr>
</tbody>
</table>

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Control Devices, Components, Wiring and Material.
B. Instructions for Owners.

1.2 QUALITY ASSURANCE
A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years experience.
B. TCC: Company specializing in the work of this section with minimum five years temperature control experience.
C. Technician: Minimum five years experience installing commercial temperature control systems.
D. TCCs are limited to firms regularly employing a minimum of five full-time temperature control technicians within 100 miles of the job site.

1.3 REFERENCES

1.4 DELIVERY, STORAGE AND HANDLING
A. Provide factory-shipping cartons for each piece of equipment and control device. Maintain cartons through shipping, storage, and handling as required to prevent equipment damage. Store equipment and materials inside and protected from weather.
B. Factory-Mounted Components: Where control devices specified in this section are indicated to be factory mounted on equipment, arrange for shipping control devices to unit manufacturer.

1.5 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION
A. Temperature Sensor Sockets.
B. Gauge Taps.

1.6 AGENCY AND CODE APPROVALS
A. All products shall have the following agency approvals. Provide verification that the approvals exist for all submitted products with the submittal package.
1. UL-916; Energy Management Systems.
2. C-UL listed to Canadian Standards Association C22.2 No. 205-M1983 “Signal Equipment.”

1.7 ACRONYMS

A. Acronyms used in this specification are as follows:

1. B-AAC BACnet Advanced Application Controller
2. B-ASC BACnet Application Specific Controller
3. BTL BACnet Testing Laboratories
4. DDC Direct Digital Controls
5. FMCS Facility Management and Control System
6. GUI Graphic User Interface
7. IBC Interoperable BACnet Controller
8. IDC Interoperable Digital Controller
9. LAN Local Area Network
10. NAC Network Area Controller
11. ODBC Open DataBase Connectivity
12. OOT Object Oriented Technology
13. OPC Open Connectivity via Open Standards
14. PICS Product Interoperability Compliance Statement
15. PMI Power Measurement Interface
16. POT Portable Operator’s Terminal
17. TCC Temperature Control Contractor
18. TCS Temperature Control System
19. WAN Wide Area Network
20. WBI Web Browser Interface

1.8 SUMMARY

A. Extend Existing System:

1. Extend the existing FMCS for this project.

2. All controllers and accessories shall interface with the existing FMCS.

B. TCC shall furnish all labor, materials, equipment, and service necessary for a complete and operating Temperature Control System (TCS) and Facility Management and Control System (FMCS) using Direct Digital Controls as shown on the drawings and as described herein.

C. All labor, material, equipment and software not specifically referred to herein or on the plans that is required to meet the intent of this specification shall be provided without additional cost to the Owner.

D. The Owner shall be the named license holder of all software associated with any and all incremental work on the project.

1.9 JOB CONDITIONS

A. Cooperation with Other Trades: Coordinate the Work of this section with that of other sections to ensure that the Work will be carried out in an orderly fashion. It is this Contractor's responsibility to check the Contract Documents for possible conflicts.
between the Work of this section and that of other crafts in equipment location; pipe, duct and conduit runs; electrical outlets and fixtures; air diffusers; and structural and architectural features.

1.10 WARRANTY

A. Refer to Section 23 05 00 for warranty requirements.

B. Within the warranty period, any defects in the work provided under this section due to faulty materials, methods of installation or workmanship shall be promptly (within 48 hours after receipt of notice) repaired or replaced by this Contractor at no expense to the Owner.

C. Warranty requirements include furnishing and installing all FMCS software upgrades issued by the manufacturer during the one-year warranty period.

D. Update all software and back-ups during warranty period and all user documentation on the Owner’s archived software disks.

1.11 WARRANTY ACCESS

A. The Owner shall grant to this Contractor reasonable access to the TCS and FMCS during the warranty period.

PART 2 - PRODUCTS

2.1 CONDUIT

A. Conduit and Fittings: Refer to Electrical Section 26 05 33 for materials and sizing.

2.2 WIRE AND CABLE

A. Wire and Cable Materials: Refer to Electrical Section 26 05 13 for wire and cable materials.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Verify that systems are ready to receive work. Beginning of installation means installer accepts existing conditions.

B. Install system and materials in accordance with manufacturer’s instructions.

C. Install all operators, sensors, and control devices where accessible for service, adjustment, calibration, and repair. Do not install devices where blocked by piping or ductwork. Devices with manual reset or limit adjustments shall be installed below 6'-0" if practical to allow inspection without using a ladder.

D. After completion of installation, test and adjust control equipment.

E. Check calibration of instruments. Recalibrate or replace.

F. Furnish and install conduit, wire, and cable per the National Electric Code, unless noted otherwise in this section.
G. All hardware, software, equipment, accessories, wiring (power and sensor), piping, relays, sensors, power supplies, transformers, and instrumentation required for a complete and operational FMCS system, but not shown on the electrical drawings, are the responsibility of the TCC.

H. Labels For Control Devices:
   1. Provide labels indicating service of all control devices in panels and other locations.
   2. Labels may be made with permanent marking pen in the control panels if clearly legible.

3.2 CONDUIT INSTALLATION

A. Conduit Sizing and Installation: Refer to Electrical Section 26 05 33 for execution and installation.
   1. Thermostats/temperature sensors shall be installed in junction boxes, flush with the wall, and shall be coordinated for orientation with Architect/Engineer.

3.3 WIRE AND CABLE INSTALLATION

A. Wire and Cable Materials Installation: Refer to Electrical Section 26 05 13 for execution and installation.

B. Field Quality Control:
   1. Inspect wire and cable for physical damage and proper connection.
   2. Torque test conductor connections and terminations to manufacturer’s recommended values.
   3. Perform continuity test on all conductors.
   4. Protection of cable from foreign materials:
      a. It is the Contractor’s responsibility to provide adequate physical protection to prevent foreign material application or contact with any cable type. Foreign material is defined as any material that would negatively impact the validity of the manufacturer’s performance warranty. This includes, but is not limited, to overspray of paint (accidental or otherwise), drywall compound, or any other surface chemical, liquid or compound that could come in contact with the cable, cable jacket or cable termination components.
      b. Overspray of paint on any cable, cable jacket or cable termination component will not be accepted. It shall be the Contractor’s responsibility to replace any component containing overspray, in its entirety, at no additional cost to the project. Cleaning of the cables with harsh chemicals is not allowed. This requirement is regardless of the PASS/FAIL test results of the cable containing overspray. Should the manufacturer and warrantor of the structured cabling system desire to physically inspect the installed condition and certify the validity of the structured cabling system (via a signed and dated statement by an authorized representative of the structured cabling manufacturer), the
Owner may, at their sole discretion, agree to accept said warranty in lieu of having the affected cables replaced. In the case of plenum cabling, in addition to the statement from the manufacturer, the Contractor shall also present to the Owner a letter from the local Authority Having Jurisdiction stating that they consider the plenum rating of the cable to be intact and acceptable.

C. Installation Schedule:

1. Conduit terminations to all devices installed in applications with rotating equipment, expansion/contraction or vibration shall be made with flexible metallic conduit, unless noted otherwise. Final terminations to exterior devices installed in damp or wet locations shall be made with liquidtight flexible metallic conduit. Terminations in hazardous areas, as defined in the National Electrical Code, shall be connected using flexible conduit rated for the environment.

3.4 FMCS INSTALLATION

A. Coordinate voltage and ampacity of all contacts, relays, and terminal connections of equipment being monitored or controlled. Voltage and ampacity shall be compatible with equipment voltage and be rated for full ampacity of wiring or overcurrent protection of circuit controlled.

B. Naming Conventions: Coordinate all point naming conventions with Owner standards. In the absence of Owner standards, naming conventions shall use equipment designations shown on plans.

3.5 PREPARATION FOR BALANCING

A. Check the calibration and setpoints of all controllers.

B. Verify the operation of all interlock systems.

3.6 TEST AND BALANCE COORDINATION

A. The Contractor shall furnish a single set of all tools necessary to interface to the control system for test and balance purposes.

B. The Contractor shall provide a minimum of four (4) hours training for the Balancing Contractor in the use of these tools.

C. The tools used during the test and balance process shall be returned at the completion of the testing and balancing.

3.7 DEMONSTRATION AND ACCEPTANCE

A. At completion of installation, provide one (1) hour minimum instruction for operators. Demonstrate operation of all controls and systems. Describe the normal operation of all equipment.

3.8 TRAINING

A. On-Site:

1. The manufacturer shall provide 4 hours of training for 4 Owner’s representatives. The training course shall enable the Owner’s representatives to perform Day-to-Day Operations as defined herein. A factory-trained instructor with experience in
presenting the training material and the system programmer for this project shall perform the training.

B. Day-to-Day Operations - Training Description:
   1. Understand FMCS systems components.
   2. Recognize malfunctions of the system.
   3. Understand the job layout and location of control components.

C. System Management - Training Description:
   1. Maintain software and prepare backups.
   2. Interface with job-specific, third-party operator software.
   3. Add new users and understand password security procedures.

3.9 INSTALLATION OF SENSORS

A. Install sensors in accordance with the manufacturer’s recommendations.

B. Mount sensors rigidly and adequately for the environment within which the sensor operates.

C. All pipe-mounted temperature sensors shall be installed in immersion wells. Install all liquid temperature sensors with heat-conducting fluid in thermal wells.

D. Each bid shall include the cost of on-site start-up, commissioning and training.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Thermometers.
   B. Test Plugs.

1.2 REFERENCES
   A. ANSI/AWWA C706 - Direct Reading, Remote Registration Systems for Cold Water Meters.

1.3 SUBMITTALS
   A. Submit shop drawings per Section 23 05 00. Include list that indicates use, operating range, total range and location for manufactured components.

PART 2 - PRODUCTS

2.1 THERMOMETERS
   A. Alcohol/Spirit Filled Type:
      1. 9" long phenolic case, steel stem, accuracy of 1% full scale. Adjustable elbow joint with locking device to allow rotation of thermometer to any angle.
      2. Select thermometer for appropriate temperature range.
      3. Stem lengths as required for application with minimum insertion of 3".
      4. Thermometers for water, steam, or oil shall have brass or steel separable socket. Wells shall extend through insulation. Thermometers for air shall have an aluminum or brass duct flange.
   B. Select scales to cover expected range of temperatures.

2.2 TEST PLUGS
   A. Test Plug: 1/4" or 1/2" brass fitting and cap, with Nordel core for temperatures up to 275°F, for receiving 1/8" outside diameter pressure or temperature probe. Plugs shall be rated for zero leakage from vacuum to 500 psi.
   B. Provide extended units for all plugs installed in insulated piping.
   C. Test Kit: Carrying case, internally padded and fitted containing one 3-1/2" diameter pressure gauge with 0-100 psi range, one gauge adapter with 1/8" probes, two 1-1/2" dial thermometers with 0° to 220°F and -25°F to 125°F ranges and 5" stems.
PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation Requirements:
   1. Install per manufacturer's instructions.
   2. Coil and conceal excess capillary on remote element instruments.
   3. Install gauges and thermometers in locations where they are easily read from normal operating level.
   4. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

B. Thermometers:
   1. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2" for installation of thermometer sockets.
   2. Install thermometer sockets adjacent to control system thermostat, transmitter and sensor sockets.
   3. Locate duct thermometers minimum 10 feet downstream of mixing dampers, coils, or other devices causing air turbulence.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Pipe and Pipe Fittings.
B. Valves.
C. Chilled Water Piping System.

1.2 QUALITY ASSURANCE
A. Valves: Manufacturer's name and pressure rating marked on valve body. Remanufactured valves are not acceptable.
B. Welding Materials, Procedures, and Operators: Conform to ASME Section 9, ANSI/AWS D1.1, and applicable state labor regulations.

1.3 REFERENCES
B. ASME B16.5 - Pipe Flanges and Flanged Fittings.
C. ASME B16.9 - Factory-Made Wrought Steel Butt Welding Fittings.
D. ASME B18.2.1 - Square and Hex Bolts and Screws, Inch Series.
E. ASME B18.2.2 - Square and Hex Nuts, Inch Series.
F. ASME B31.9 - Building Services Piping.
G. ASME Section 9 - Welding and Brazing Qualifications.
H. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
L. ASTM E413-87 - Classification for Rating Sound Insulation

1.4 SUBMITTALS
A. Submit product data under provisions of Section 23 05 00. Include data on pipe materials, fittings, valves, and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Store and protect piping to prevent entrance of foreign matter into pipe and to prevent exterior corrosion.
B. Deliver and store valves in shipping containers with labeling in place.
1.6 COORDINATION DRAWINGS

A. Reference Coordination Drawings article in Section 23 05 00 for required hydronic systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.

PART 2 - PRODUCTS

2.1 GLYCOL WATER SUPPLY

GLYCOL WATER RETURN

A. Design Pressure: 125 psig.
Maximum Design Temperature: 225°F. (230°F for grooved couplings)

B. Piping - 2-1/2" and Over:
1. Pipe: Standard weight black steel, beveled ends, ASTM A53, Type E or S, Grade B.

C. Piping - 2-1/2" and Over:
1. Pipe: Standard weight black steel, grooved ends, ASTM A53, Type E or S, Grade B.
2. Joints: Grooved type, with Grade E EPDM molded pressure-responsive gaskets suited for 0°F to 230°F per ASTM D2000.
3. Fittings: ASTM A536 Grade 65-45-12 ductile or A47 malleable iron, grooved type.
4. Flanges: Grooved end, flanged adapter.

D. Shutoff Valves:
1. Gate Valves:
   a. GA-2: 2-1/2" thru 12", 125 psi S @ 353°F, 200 psi WOG @ 150°F, flanged, iron body, bronze mounted, OS&Y. Crane #465-1/2, Hammond, Stockham #G623, Walworth, Milwaukee #F2885, Watts #F-503, NIBCO F-617-O.

   2. Butterfly Valves:
      a. BF-1:
         1) 2-1/2" thru 6", 175 psi CWP, elastomers rated for 20°F to 225°F continuous and 250°F intermittent at 125 psig, fully lugged end, ductile or cast iron body (not in contact with fluid); bronze, aluminum-bronze or EPDM coated ductile iron disc; EPDM seat, stainless steel stem, extended neck, 175 psi bubble-tight, bi-directional dead-end shutoff without backing flange or nuts.
and with cap screws extending to centerline of valve body (for pipe extension without draining system), 10 position locking operator up to 6” size. Cv of at least 1580 in 6” size. Center Line Series 200, Keystone #222, Watts #DBF-03-121-1P, Nibco N200 Series, Milwaukee CL series, Hammond 5200 series.

E. Throttling Valves:
1. Globe Valves:
   a. GL-2: 4” thru 10”, 125 psi S @ 353°F, 200 psi WOG @ 150°F, flanged, iron body, bronze mounted. Crane #351, Hammond #IR116, Stockham #G-512, Walworth #906F, Milwaukee #F2981, Watts #F-501, or NIBCO #F-718.

2. Butterfly Valves:
   a. BF-4:
      1) 2-1/2” thru 6”, 175 psi CWP, elastomers rated for 20°F to 225°F continuous and 250°F intermittent at 125 psig, fully lugged or grooved end, ductile or cast iron body (not in contact with fluid); bronze, aluminum-bronze or EPDM coated ductile iron disc; EPDM seat, stainless steel stem, extended neck, 175 psi bubble-tight, bi-directional dead-end shutoff without backing flange or nuts and with cap screws extending to centerline of valve body (for pipe extension without draining system), infinite position locking operator with memory stop up to 6” size. Cv of at least 1580 in 6” size. Victaulic #300, Center Line Series 200, Keystone #222, Watts #DBF-03-121-1P, NIBCO #LD2000, Milwaukee CL series, Hammond 5200 series.

F. Check Valves:
1. CK-13: 2-1/2” thru 12”, 200# WOG, double disc wafer type, iron body, bronze or aluminum-bronze discs, 316SS shaft and spring, Viton, EPDM or BUNA-N, Cv of at least 700 in 6” size. Mueller Steam Specialty Co. #71-AHB-6-H, Stockham #WG-961, NIBCO W-920-W, Crane, Victaulic #716.

G. Strainers:
1. ST-1: Bronze body, screwed ends, screwed cover, 125 psi S @ 353°F, 200 psi WOG @ 150°F. Armstrong #F4SC, Metraflex #TS, Mueller Steam Specialty Co. #351, Sarco #BT, Watts #777, NIBCO T-122-A.

2. ST-2: Cast iron body, 125 lb. flanged ends, bolted cover, 125 psi S @ 353°F, 175 psi WOG @ 150°F. Armstrong #A1FL, Metraflex #TF, Mueller Steam Specialty Co.#758, Sarco #CI-125, Watts #777-D, Victaulic #732, NIBCO F-721-A.

2.2 AIR VENTS
A. At end of main and other points where large volume of air may be trapped - Use 1/4” globe valve, angle type, 125 psi, Crane #89, attached to coupling in top of main, 1/4” discharge pipe turned down with cap.
B. On branch lines and small heating units - Use coin-operated air vent equal to B&G #4V, attached to 1/8” coupling in top of pipe. Install air vents on all coils and terminal heating units.

2.3 AUTOMATIC AIR VENTS

A. Low capacity automatic air vent (for bladder tank anti-thermosyphon loops). Maximum operating pressure and temperature of at least 240°F and 125 psi, 1/2” or 3/4” inlet. B&G #87, Armstrong, Spirotherm, Taco, or Watts.

B. High/low capacity automatic air vent (for air separator connection). Maximum operating pressure and temperature of at least 240°F and 125 psi, 3/4” inlet, 3/8” minimum outlet. B&G #107, Armstrong, Spirotherm, Taco, or Watts.

2.4 STRainers

A. Unless otherwise indicated, strainers shall be Y-pattern and have stainless steel screens with perforations as follows:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>1/4&quot; - 2&quot;</th>
<th>2-1/2&quot; - 8&quot;</th>
<th>10&quot; and Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water and Glycol/Water</td>
<td>1/32&quot;</td>
<td>1/16&quot;</td>
<td>1/8&quot;</td>
</tr>
</tbody>
</table>

B. Furnish pipe nipple with ball valve, threaded hose connection, and cap to blow down all strainer screens.

C. Use bronze body strainers in copper piping and iron body strainers in ferrous piping.

2.5 DRAIN VALVES AND BLOWDOWN VALVES

A. Drain valve and blowdown valve shall mean a shutoff valve as specified for the intended service with added 3/4” male hose thread outlet, cap, and retaining chain.

2.6 ETHYLENE GLYCOL

A. Fill glycol systems with a mixture of water and ethylene glycol based low temperature industrial heat transfer fluid with an expected life of at least 12 years in normal use. Water shall meet the glycol manufacturer’s recommendations (generally < 25ppm chloride, sulfite, and hardness). Distilled, deionized, or reverse osmosis water is acceptable, as are pre-diluted solutions from the manufacturer. Solution shall contain a fluorescent dye to facilitate leak detection.

B. Fluid suitable for use from -60°F to 250°F.

C. Glycol shall pass ASTM D1384 (less than 0.5 mils annual penetration of all system metals). Glycol supplier shall provide a certificate of assurance.

D. A 40% solution by weight shall depress the freezing point to at least -29°F. At 40°F the solution shall have viscosity of not over 6 centipoise, thermal conductivity of at least 0.21 Btu/hr*ft*ºF, specific heat of at least 0.79 Btu/lbm*ºF, and specific gravity of at least 1.08.

E. The glycol manufacturer shall analyze the fluid biannually to ensure the corrosion protection properties continue to meet industry standards. This shall be at no cost to the Owner. No chemical additions shall be made to the glycol solution until an analysis is completed.

F. Automotive glycol containing sodium silicate is not acceptable.

2.7 LOCK OUT TRIM

A. Provide lock out trim for all quarter turn valves opening to atmosphere installed in heating water piping over 120°F and as indicated on the drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends, remove burrs, bevel plain end ferrous pipe.
B. Remove scale and dirt on inside and outside before assembly.
C. Connect to all equipment with flanges or unions.
D. After completion, fill, clean, and treat systems. Refer to Section 23 25 00 for treatment.

3.2 TESTING PIPING

A. Glycol Water:
   1. Test pipes underground or in chases and walls before piping is concealed.
   2. Complete testing before insulation is applied. If insulation is applied before pipe is tested and a leak ruins the insulation, replace all damaged insulation.
   3. Test the pipe with 100 psig water pressure. Hold pressure for at least two hours.
   4. Test to be witnessed by the Architect/Engineer or their representative, if requested by the Architect/Engineer.

3.3 CLEANING PIPING

A. Assembly:
   1. Prior to assembly of pipe and piping components, remove all loose dirt, scale, oil and other foreign matter on internal or external surfaces by means consistent with good piping practice subject to approval of the Architect/Engineer. Blow chips and burrs out of pipe before assembly. Wipe cutting oil from internal and external surfaces.
   2. During fabrication and assembly, remove slag and weld spatter from both internal and external joints by peening, chipping and wire brushing to the degree consistent with good piping practices.
   3. Notify the Architect/Engineer prior to starting any post erection cleaning operation in time to allow witnessing the operation. Properly dispose of cleaning and flushing fluids.
   4. Prior to blowing or flushing erected piping systems, disconnect all instrumentation and equipment, open wide all valves, control valves, and balance valves, and verify all strainer screens are in place.
3.4 INSTALLATION

A. General Installation Requirements:

1. Route piping in orderly manner, straight, plumb, with consistent pitch, parallel to building structure, with minimum use of offsets and couplings. Provide only offsets required for needed headroom or clearance and needed flexibility in pipe system.

2. Install piping to conserve building space, and not interfere with other work.

3. Group piping whenever practical at common elevations.

4. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

5.Reducers are generally not shown. Where pipe sizes change at tee, the tee shall be the size of the largest pipe shown connecting to it. Where pipe sizes are not shown, the larger size in either direction shall continue through the fitting nearest to the indication of a smaller pipe size.

6. Install bell and spigot pipe with bells upstream.

7. Seal pipes passing through exterior walls with a wall seal per Section 23 05 29. Provide Schedule 40 galvanized sleeve at least 2 pipe sizes larger than the pipe.

8. Branch takeoffs shall be from the top, side, or bottom of piping.

B. Installation Requirements in Electrical Rooms:

1. Do not install piping or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet from the floor to the structural ceiling with width and depth equal to the equipment plus its required clearance space.

C. Valves/Fittings and Accessories:

1. Provide chain operators for all valves over 2" size that are over 10'-0" above finished floor. Extend to 7'-0" above finished floor.

2. Provide valve position indicator on all valves 10'-0" or greater above finish floor and not located above ceiling.

3. Provide clearance for installation of insulation, and access to valves and fittings.

4. Provide access doors where valves are not exposed.

5. Install balancing valves with the manufacturer’s recommended straight upstream and downstream diameters of pipe.

6. Prepare pipe, fittings, supports, and accessories for finish painting.

7. Install valves with stems upright or horizontal, not inverted, except install manual quarter turn valves in radiation cabinets and all butterfly valves with stems horizontal.
8. Provide shutoff valves and flanges or unions at all connections to equipment, traps, and items that require servicing.

9. Provide flanges or unions at all final connections to equipment, traps and valves.

10. Arrange piping and piping connections so equipment may be serviced or totally removed without disturbing piping beyond final connections and associated shutoff valves.

3.5 PIPE ERECTION AND LAYING

A. Carefully inspect all pipe, fittings, valves, equipment and accessories prior to installation. Immediately reject and remove from the job any items which are unsuitable, cracked or otherwise defective.

B. All pipe, fittings, valves, equipment and accessories shall have factory-applied markings, stampings, or nameplates sufficient to determine their conformance with specified requirements.

C. Exercise care at every stage of storage, handling, laying and erecting to prevent entry of foreign matter into piping, fittings, valves, equipment and accessories. Do not erect or install any unclean item.

D. During construction, until system is fully operational, keep all openings in piping and equipment closed at all times except when actual work is being performed on that item. Closures shall be plugs, caps, blind flanges or other items designed for this purpose.

E. Change direction of pipes only with fittings or pipe bends. Change size only with fittings. Do not use miter fittings, face or flush bushings, or street elbows. All fittings shall be long radius type, unless otherwise shown on the drawings or specified. Construct welded elbows of angles not available as standard fittings by cutting and welding standard elbows to form smooth, long radius fittings.

F. Use full and double lengths of pipe wherever possible.

G. Unless otherwise indicated, install all inlet and outlet piping, including shutoff valves and strainers, to coils, pumps and other equipment at line size with reduction in size being made only at control valve or pump.

H. Cut all pipe to exact measurement and install without springing or forcing except in the case of expansion loops where cold springing is indicated on the drawings.

I. Do not create, even temporarily, undue loads, forces or strains on valves, equipment or building elements.

3.6 DRAINING AND VENTING

A. Unless otherwise indicated on the drawings, all horizontal pipes, including branches, shall pitch 1" in 40 feet to low points for complete drainage, removal of condensate, and venting.

B. Provide drain valves at all low points of water piping systems or where indicated on drawings for complete or sectionalized draining. Drain valves are defined above.

C. Use eccentric reducing fittings on horizontal runs when changing size for proper drainage and venting. Install all liquid lines with top of pipe and eccentric reducers in a continuous line.
D. Provide air vents at all high points and wherever else required for elimination of air in all water piping systems. Do not use automatic air vents in glycol systems unless they are piped to the fill tank.

E. Air vents shall be in accessible locations. If needed to trap and vent air in a remote location, a 1/8" pipe shall connect the tapping location to a venting device in an accessible location.

F. All vent and drain piping shall be of same materials and construction as the service involved.

3.7 BRANCH CONNECTIONS

A. Make branch connections with standard tee or cross fittings of the type required for the service unless otherwise specified herein or detailed on the drawings.

B. At the option of the Contractor, branch connections from headers and mains may be cut into black steel pipe using forged weld-on fittings.

C. Use of forged weld-on fittings is also limited as follows:
   1. Must have at least same pressure rating as the main.
   2. Header or main must be 2-1/2" or over.
   3. Branch line is at least two pipe sizes under header or main size.

3.8 JOINING OF PIPE

A. Welded Joints:
   1. Welding of all pipe joints, both as to procedures and qualification of welders, shall be in accordance with Section IX, ASME "Boiler & Pressure Vessel Code" unless local codes take precedence.
   2. Furnish certificates qualifying each welder to the Owner's Representative prior to start of work.
   3. The Owner's Representative reserves the right to require qualifying demonstration, at the Contractor's expense, of any welders assigned to the job.
   4. Ends of pipe and fittings to be joined by butt-welding shall be beveled, cleaned to bare metal and internal diameters aligned before tack welding.
   5. Backing rings shall be used for all butt weld joints 3” pipe size and over and for all sizes where operating pressure is over 200 psig and/or temperature is over 400ºF. Backing rings shall be of the material being welded.

B. Grooved Joints:
   1. Grooved connections shall mechanically engage, lock and seal the grooved pipe ends in a positive couple. Each coupling shall have malleable iron housing clamps, steel bolts and nuts, and sealing gasket designed so internal pressure increases the tightness of the seal. Couplings must be installation-ready style for quick installation and no more than two-piece housings.
   2. All work, including pipe grooving, shall be accomplished in accordance with manufacturer's published instructions.
3. Final tightening of bolts shall be with a torque wrench to ensure equal tension in all bolts.

4. All fittings shall be provided by one manufacturer. Mixing fittings will not be acceptable.

5. A factory-trained manufacturer’s representative shall periodically visit the site for contractor training and to review the grooved joint installations.


END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements applicable to all Division 26 Sections. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced in each specification section.

1.2 SCOPE OF WORK

A. This Specification and the associated drawings govern furnishing, installing, testing and placing into satisfactory operation the Electrical Systems.

B. The Contractor shall furnish and install all new materials as indicated on the drawings, and/or in these specifications, and all items required to make his portion of the Electrical Work a finished and working system.

C. Description of Systems shall be as follows:

1. Electrical power system to and including equipment, motors, devices, etc.
2. Grounding system.
3. Wiring of equipment furnished by others.
4. Removal work and/or relocation and reuse of existing systems and equipment.
5. Telecommunications rough-in, as shown on drawings, for installation of telecommunications equipment by others under separate contract.

D. Work Not Included:

1. Telecommunications cabling will be by others, in raceways and conduits furnished and installed as part of the Electrical work.
2. Temperature control wiring for plumbing and HVAC equipment (unless otherwise indicated) will be by other Contractors.

1.3 WORK SEQUENCE

A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours are required.

1.4 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL, AND CONTROL CONTRACTORS

A. Division of work is the responsibility of the Prime Contractor. Any scope of work described at any location on the contract document shall be sufficient for including said requirement in the project. The Prime Contractor shall be solely responsible for determining the appropriate subcontractor for the described scope. In no case shall the project be assessed an additional cost for scope that is described on the contract.
documents on bid day. The following division of responsibility is a guideline based on typical industry practice.

B. Definitions:

1. "Mechanical Contractors" refers to the Contractors listed in Division 21/22/23 of this Specification.

2. Motor Power Wiring: The single phase or 3 phase wiring extending from the power source (transformer, panelboard, feeder circuits, etc.) through disconnect switches and motor controllers to, and including the connections to the terminals of the motor.

3. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case, the devices are usually single phase, have "Manual-Off-Auto" provisions, and are usually connected into the motor power wiring through a manual motor starter.

4. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.

5. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. When the motor power wiring exceeds 120 volts, a control transformer is usually used to give a control voltage of 120 volts.

6. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring that directly powers or controls a motor used to drive equipment such as fans, pumps, etc. This wiring will be from a 120 volt source and may continue as 120 volt, or be reduced in voltage (24 volt), in which case a control transformer shall be furnished as part of the temperature control wiring.

7. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.

8. Low Voltage Technology Wiring: The wiring associated with the Technology Systems, used for analog or digital signals between equipment.

9. Telecommunications Rough-in: Relates specifically to the backboxes, necessary plaster rings and other miscellaneous hardware required for the installation or mounting of telecommunications information outlets.

C. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractors’ responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, fans, chillers, compressors, etc. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals approved. Therefore, the electrical drawings show only known wiring related to such items. All wiring not
shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.

2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall furnish complete wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.

3. The Electrical Contractor shall establish electrical utility elevations prior to fabrication and installation. The Electrical Contractor shall coordinate utility elevations with other trades. When a conflict arises, priority shall be as follows:
   a. Lighting Fixtures
   b. Gravity flow piping, including steam and condensate.
   c. Sheet metal.
   d. Other piping.
   e. Conduits and wireway.

D. Mechanical Contractor's Responsibility:
   1. Assumes responsibility for internal wiring of all equipment furnished by the Mechanical Contractor.
   2. Assumes all responsibility for miscellaneous items furnished by the Mechanical Contractor that require wiring but are not shown on the electrical drawings or specified in the Electrical Specification. If items such as relays, flow switches, or interlocks are required to make the mechanical system function correctly or are required by the manufacturer, they are the responsibility of the Mechanical Contractor.
   3. Assumes all responsibility for Temperature Control wiring, if the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.
   4. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

E. Temperature Control Contractor's or Subcontractor's Responsibility:
   1. Wiring of all devices needed to make the Temperature Control System functional.
   2. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control Contractor or Subcontractor.
   3. Coordinating equipment locations (such as PE's, EP's, relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.

F. Electrical Contractor's Responsibility:
   1. Furnishes and installs all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor in the Mechanical Drawings or Specifications.
2. Installs and wires all remote control devices furnished by the Mechanical Contractor or Temperature Control Contractor when so noted on the Electrical Drawings.

3. Furnishes and installs motor control and temperature control wiring, when noted on the drawings.

4. Furnishes, installs, and connects all relays, etc., for automatic shutdown of certain mechanical equipment (supply fans, exhaust fans, etc.) upon actuation of the Fire Alarm System.

5. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.5 QUALITY ASSURANCE

A. Contractor’s Responsibility Prior to Submitting Pricing/Bid Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guides, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Architect/Engineer any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.

2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor’s own employees. Any work performed prior to receipt of instructions from the Architect/Engineer will be done at the Contractor’s risk.

B. Qualifications:

1. Only products of reputable manufacturers as determined by the Architect/Engineer are acceptable.

2. All Contractors and subcontractors shall employ only workmen who are skilled in their trades. At all times, the number of apprentices at the job site shall be less than or equal to the number of journeymen at the job site.

C. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the City of Champaign, Illinois Codes, Laws, Ordinances and other regulations having jurisdiction over this installation.

2. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.

3. If the Contractor notes, at the time of bidding, any parts of the drawings or specifications that do not comply with the codes or regulations, he shall inform
the Architect/Engineer in writing, requesting a clarification. If there is insufficient
time for this procedure, he shall submit with his proposal a separate price to
make the system comply with the codes and regulations.

4. All changes to the system made after the letting of the contract to comply with
codes or the requirements of the Inspector, shall be made by the Contractor
without cost to the Owner.

5. If there is a discrepancy between manufacturer's recommendations and these
specifications, the manufacturer's recommendations shall govern.

6. If there are no local codes having jurisdiction, the current issue of the National
Electrical Code shall be followed.

D. Permits, Fees, Taxes, Inspections:

1. Procure all applicable licenses.

2. Abide by all laws, regulations, ordinances, and other rules of the State or Political
Subdivision where the work is done, or as required by any duly constituted public
authority.

3. Pay all charges for permits or licenses.

4. Where applicable, all fixtures, equipment and materials shall be listed by
Underwriter's Laboratories, Inc. or a nationally recognized testing organization.

E. Examination of Drawings:

1. The drawings for the electrical work are completely diagrammatic, intended to
convey the scope of the work and to indicate the general arrangements and
locations of equipment, outlets, etc., and the approximate sizes of equipment.

2. Contractor shall determine the exact locations of equipment and rough-ins, and
the exact routing of raceways so as to best fit the layout of the job. Conduit entry
points for electrical equipment including, but not limited to, panelboards,
switchboards, switchgear and unit substations, shall be determined by the
Contractor unless noted in the contract documents.

3. Scaling of the drawings will not be sufficient or accurate for determining these
locations.

4. Where job conditions require reasonable changes in arrangements and locations,
such changes shall be made by the Contractor at no additional cost to the
Owner.

5. Because of the scale of the drawings, certain basic items, such as junction
boxes, pull boxes, conduit fittings, etc., may not be shown, but where required by
other sections of the specifications or required for proper installation of the work,
such items shall be furnished and installed.

6. If an item is either shown on the drawings or called for in the specifications, it
shall be included in this contract.

7. The Contractor shall determine quantities and quality of material and equipment
required from the documents. Where discrepancies arise between drawings,
schedules and/or specifications, the greater and better quality number shall govern.

8. Where used in electrical documents the word “furnish” shall mean supply for use, the word “install” shall mean connect up complete and ready for operation, and the word “provide” shall mean to supply for use and connect up complete and ready for operation.

9. Any item listed as furnished shall also be installed unless otherwise noted.

10. Any item listed as installed shall also be furnished unless otherwise noted.

F. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing Revit.

2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.

3. Upon request for electronic media, the Contractor shall complete and return a signed “Electronic File Transmittal” form provided by KJWW.

4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.

5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.

6. The drawings prepared by KJWW for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.

7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.

8. The information is provided to expedite the project and assist the Contractor with no guarantee by KJWW as to the accuracy or correctness of the information provided. KJWW accepts no responsibility or liability for the Contractor’s use of these documents.

G. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any conduit, conductors, wireways, bus duct, fittings, etc.

1.6 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 1.
B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
2. Submit in Excel format.
3. Support values given with substantiating data.

C. Preparation:

1. Itemize the cost for each of the following:
   a. Overhead and profit.
   b. Bonds.
   c. Insurance.
   d. General Requirements: Itemize all requirements.

2. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
   a. Contractor’s own labor forces.
   b. All subcontractors.
   c. All major suppliers of products or equipment.

3. Break down all costs into:
   a. Material: Delivered cost of product with taxes paid.
   b. Labor: Labor cost, excluding overhead and profit.

4. For each line item having an installed cost of more than $5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:
   a. Each piece of equipment requiring shop drawings. Use the equipment nomenclature (SB-1, PANEL P-1, etc.) on the Schedule of Values.
   b. Each type of small unitary equipment (e.g., FDS, FCS, CS, etc.). Multiple units of the same type can be listed together provided quantities are also listed so unit costs can be determined.
   c. Each conduit system (medium voltage, normal, emergency, low voltage systems, etc.). In addition, for larger projects break down the material and labor for each conduit system based on geography (building, floor, and/or wing).
   d. Fire alarm broken down into material and labor for the following:
      1) Engineering
      2) Controllers, devices, sensors, etc.
      3) Conduit
      4) Wiring
      5) Programming
      6) Commissioning
   e. Site utilities (5’ beyond building)
   f. Testing
   g. Commissioning
   h. Record drawings
   i. Punchlist and closeout
D. Update Schedule of Values when:

1. Indicated by Architect/Engineer.
2. Change of subcontractor or supplier occurs.
3. Change of product or equipment occurs.

1.7 CHANGE ORDERS

A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders with inadequate breakdown will be rejected.

B. Change order work shall not proceed until authorized.

1.8 PRODUCT DELIVERY, STORAGE, HANDLING AND MAINTENANCE

A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage.

B. Keep all materials clean, dry and free from damaging environments.

C. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Electrical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.

D. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate his/her work with other trades.

1.9 WARRANTY

A. Provide one-year warranty for all fixtures, equipment, materials, and workmanship.

B. The warranty period for all work in this specification Division shall commence on the date of Substantial Completion or successful system performance whichever occurs later. The warranty may also commence if a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization of the Owner. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.

C. Warranty requirements extend to correction, without cost to the Owner, of all work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage due to defects or nonconformance with contract documents excluding repairs required as a result of improper maintenance or operation, or of normal wear as determined by the Architect/Engineer.

1.10 INSURANCE

A. This Contractor shall maintain insurance coverage as set forth in Division 1 of these specifications.
1.11 MATERIAL SUBSTITUTION

A. Where several manufacturers’ names are given, the manufacturer for which a catalog number is given is the basis of design and establishes the quality required.

B. Equivalent equipment manufactured by the other named manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications, and fit in the allocated space. The Architect/Engineer shall make the final determination of whether a product is equivalent.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer via addendum. The Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on his part or on the part of other Contractors whose work is affected.

D. Voluntary add or deduct prices for alternate materials may be listed on the bid form. These items will not be used in determining the low bidder. This Contractor assumes all costs incurred as a result of using the offered material or equipment on his part or on the part of other Contractors whose work is affected.

E. All material substitutions requested after the final addendum must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS

2.1 GENERAL

A. All items of material having a similar function (e.g., safety switches, panelboards, switchboards, contactors, motor starters, dry type transformers) shall be of the same manufacturer unless specifically stated otherwise on drawings or elsewhere in specifications.

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or his or her employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and his or her personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer’s consultants shall be indemnified and shall be made additional insureds under the Contractor’s general liability insurance policy.
3.2 ARCHITECT/ENGINEER OBSERVATION OF WORK

A. The contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:
   1. Placing fill over underground and underslab utilities.

B. The Architect/Engineer will review the installation and provide a written report noting deficiencies requiring correction. The contractor’s schedule shall account for these reviews and show them as line items in the approved schedule.

3.3 PROJECT CLOSEOUT

A. The following paragraphs supplement the requirements of Division 1.

B. Final Jobsite Observation:
   1. In order to prevent the Final Jobsite Observation from occurring too early, the Contractor shall review the completion status of the project and certify that the job is ready for the final jobsite observation.
   2. Attached to the end of this section is a typical list of items that represent the degree of job completeness expected prior to requesting a review. The Contractor shall sign the attached certification and return it to the Architect/Engineer so that the final observation can be scheduled.
   3. It is understood that if the Architect/Engineer finds the job not ready for the final observation and additional trips and observations are required to bring the project to completion, the cost of the additional time and expenses incurred by the Architect/Engineer will be deducted from the Contractor's final payment.

C. The following must be submitted before Architect/Engineer recommends final payment:
   1. Operation and maintenance manuals with copies of approved shop drawings.
   2. Record documents including marked-up or reproducible drawings and specifications.
   3. A report documenting the instructions given to the Owner's representatives complete with the number of hours spent in the instruction. The report shall bear the signature of an authorized agent of this Contractor and shall be signed by the Owner's representatives.
   4. Provide spare parts, maintenance, and extra materials in quantities specified in individual specification sections. Deliver to project site and place in location as directed and submit receipt to Architect/Engineer.
   5. Start-up reports on all equipment requiring a factory installation or start-up.

3.4 OPERATION AND MAINTENANCE MANUALS

A. General:
   1. Provide an electronic copy of the O&M manuals as described below for Architect/Engineer's review and approval. The electronic copy shall be corrected as required to address the Architect/Engineer's comments. Once corrected,
electronic copies and paper copies shall be distributed as directed by the Architect/Engineer.

2. Approved O&M manuals shall be completed and in the Owner's possession prior to Owner's acceptance and at least 10 days prior to instruction of operating personnel.

B. Electronic Submittal Procedures:

1. Distribution: Email the O&M manual as attachments to all parties designated by the Architect/Engineer.

2. Transmittals: Each submittal shall include an individual electronic letter of transmittal.

3. Format: Electronic submittals shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Submittals that are not legible will be rejected. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.

4. File Names: Electronic submittal file names shall include the relevant specification section number followed by a description of the item submitted, as follows. Where possible, include the transmittal as the first page of the PDF instead of using multiple electronic files.

   a. O&M file name: O&M.div23.contractor.YYYYMMDD
   b. Transmittal file name: O&Mtransmittal.div23.contractor.YYYYMMDD

5. File Size: Electronic file size shall be limited to a maximum of 4MB. Larger files shall be divided into files that are clearly labeled as “1 of 2”, “2 of 2”, etc.

6. Provide the Owner with an approved copy of the O&M manual on compact discs (CD), digital video discs (DVD), or flash drives with a permanently affixed label, printed with the title “Operation and Maintenance Instructions”, title of the project and subject matter of disc/flash drive when multiple disc/flash drives are required.

7. All text shall be searchable.

8. Bookmarks shall be used, dividing information first by specification section, then systems, major equipment and finally individual items. All bookmark titles shall include the nomenclature used in the construction documents and shall be an active link to the first page of the section being referenced.

C. Paper Copy Submittal Procedures:

1. Once the electronic version of the manuals has been approved by the Architect/Engineer, three (3) paper copies of the O&M manual shall be provided to the Owner. The content of the paper copies shall be identical to the corrected electronic copy.

2. Binder Requirements: The Contractor shall submit three sets of O&M manuals in heavy duty, locking three ring binders. Incorporate clear vinyl sheet sleeves on the front cover and spine for slip-in labeling. “Peel and stick” labels are not acceptable. Sheet lifters shall be supplied at the front of each notebook. The three-ring binders shall be 1/2"12mm thicker than initial material to allow for
future inserts. If more than one notebook is required, label in consecutive order. For example; 1 of 2, 2 of 2. No other form of binding is acceptable.

3. Binder Labels: Label the front and spine of each binder with “Operation and Maintenance Instructions”, title of project, and subject matter.

4. Index Tabs: Divide information by specification section, major equipment, or systems using index tabs. All tab titling shall be clearly printed under reinforced plastic tabs. All equipment shall be labeled to match the identification in the construction documents.

D. Operation and Maintenance Instructions shall include:

1. Title Page: Include title page with project title, Architect, Engineer, Contractor, all subcontractors, and major equipment suppliers, with addresses, telephone numbers, website addresses, email addresses and point of contacts. Website URLs and email addresses shall be active links in the electronic submittal.

2. Table of Contents: Include a table of contents describing specification section, systems, major equipment, and individual items.

3. Copies of all final approved shop drawings and submittals. Include Architect's/Engineer’s shop drawing review comments. Insert the individual shop drawing directly after the Operation and Maintenance information for the item(s) in the review form.

4. Copies of all factory inspections and/or equipment startup reports.

5. Copies of warranties.

6. Schematic wiring diagrams of the equipment that have been updated for field conditions. Field wiring shall have label numbers to match drawings.

7. Dimensional drawings of equipment.

8. Detailed parts lists with lists of suppliers.

9. Operating procedures for each system.

10. Maintenance schedule and procedures. Include a chart listing maintenance requirements and frequency.

11. Repair procedures for major components.

12. Replacement parts and service material requirements for each system and the frequency of service required.

13. Instruction books, cards, and manuals furnished with the equipment.

14. Include record drawings of the one-line diagrams for each major system. The graphic for each piece of equipment shown on the one-line diagram shall be an active link to its associated Operation & Maintenance data.

3.5 INSTRUCTING THE OWNER’S REPRESENTATIVE

A. Adequately instruct the Owner’s designated representatives in the maintenance, care, and operation of the complete systems installed under this contract.
B. Provide verbal and written instructions to the Owner's representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.

C. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.

D. The instructions shall include:
   1. Maintenance of equipment.
   2. Start-up procedures for all major equipment.
   3. Description of emergency system operation.

E. Notify the Architect/Engineer of the time and place for the verbal instructions to the Owner's representative so his representative can be present if desired.

F. Minimum hours of instruction time for each item and/or system shall be as indicated in each individual specification section.

G. Operating Instructions:
   1. Contractor is responsible for all instructions to the Owner's representatives for the electrical and specialized systems.
   2. If the Contractor does not have staff that can adequately provide the required instructions, he shall include in his bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.6 RECORD DOCUMENTS

A. The following paragraphs supplement the requirements of Division 1.

B. Maintain at the job site a separate and complete set of electrical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

C. Mark drawings and specifications to indicate approved substitutions; Change Orders, and actual equipment and materials used. All Change Orders, RFI responses, Clarifications and other supplemental instructions shall be marked on the documents. Record documents that merely reference the existence of the above items are not acceptable. Should this Contractor fail to complete Record Documents as required by this contract, this Contractor shall reimburse Architect/Engineer for all costs to develop record documents that comply with this requirement. Reimbursement shall be made at the Architect/Engineer's hourly rates in effect at the time of work.

D. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.

E. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

3.7 PAINTING

A. Paint all equipment that is marred or damaged prior to the Owner's acceptance. Paint and color shall match original equipment paint and shall be obtained from the equipment supplier if available. All equipment shall have a finished coat of paint applied unless specifically allowed to be provided with a prime coat only.
B. Equipment in finished areas that will be painted to match the room decor will be painted by others. Should this Contractor install equipment in a finished area after the area has been painted, he shall have the equipment and all its supports, hangers, etc., painted to match the room decor. Painting shall be performed as described in project specifications.

C. Equipment cabinets, casings, covers, metal jackets, etc., located in equipment rooms or concealed spaces, shall be furnished in standard finish, free from scratches, abrasions, chippings, etc.

D. Equipment in occupied spaces, or if standard to the unit, shall have a baked primer with baked enamel finish coat free from scratches, abrasions, chipping, etc. If color option is specified or is standard to the unit, verify with the Architect his color preference before ordering.

E. Paint all equipment in unfinished areas such as boiler room, mechanical spaces, and storage rooms. Equipment furnished with a suitable factory finish need not be painted; provided the factory applied finish is not marred or spattered. If so, equipment shall be refinished with the same paint as was factory applied.

F. Do NOT paint electric conduits in crawl spaces, tunnels, or spaces above suspended ceilings except that where conduit is in a damp location give exposed threads at joints two coats of sealer after joint is made up.

3.8 ADJUST AND CLEAN

A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project.

B. Clean all foreign paint, grease, oil, dirt, labels, stickers, etc. from all equipment.

C. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.9 SPECIAL REQUIREMENTS

A. Coordinate the installation of all equipment, controls, devices, etc., with other trades to maintain clear access area for servicing.

B. Install all equipment to maximize access to parts needing service or maintenance. Review the final location, placement, and orientation of equipment with the Owner's representative prior to setting equipment.

C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's representative will result in removal and reinstallation of the equipment at the Contractor's expense.

3.10 SYSTEM COMMISSIONING

A. The electrical systems shall be complete and operating. System start-up, testing, balancing, and satisfactory system performance is the responsibility of the Contractor. This includes all calibration and adjustment of electrical controls, balancing of loads, troubleshooting and verification of software, and final adjustments that may be needed.

B. All operating conditions and control sequences shall be tested during the start-up period. Testing all interlocks, safety shut-downs, controls, and alarms.

1. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer...
is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.11 FIELD QUALITY CONTROL

A. General:

1. Conduct all tests required during and after construction.

2. Supply necessary instruments, meters, etc., for the tests. Supply competent technicians with training in the proper testing techniques.

3. All cables and wires shall be tested for shorts and grounds following installation and connection to devices. Replace shorted or grounded wires and cables.

4. Any wiring device, electrical apparatus or lighting fixture, if grounded or shorted on any integral "live" part, shall have all defective parts or materials replaced.

5. Test cable insulation of service and panel feeder conductors for proper insulation values. Tests shall include the cable, all splices, and all terminations. Each conductor shall be tested and shall test free of short circuits and grounds and have an insulation value not less than the National Electrical Code Standards. Take readings between conductors, and between conductors and ground.

6. If the results obtained in the tests are not satisfactory make adjustments, replacements, and changes as needed. Then repeat the tests, and make additional tests, as the Architect/Engineer or authority having jurisdiction deems necessary.

B. Other Equipment:

1. Give other equipment furnished and installed by the Contractor all standard tests normally made to assure that the equipment is electrically sound, all connections properly made, phase rotation correct, fuses and thermal elements suitable for protection against overloads, voltage complies with equipment nameplate rating, and full load amperes are within equipment rating.

C. If any test results are not satisfactory, make adjustments, replacements and changes as needed and repeat the tests and make additional tests as the Architect/Engineer or authority having jurisdiction deem necessary.

END OF SECTION
In order to prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations of fire-rated construction fire sealed in accordance with specifications.
2. Electrical panels have typed circuit identification.
3. Per Section 26 05 00, cable insulation test results have been submitted.
4. Operation and Maintenance manuals have been submitted as per Section 26 05 00.
5. Bound copies of approved shop drawings have been submitted as per Section 26 05 00.
6. Report of instruction of Owner’s representative has been submitted as per Section 26 05 00.
7. Fire alarm inspection and testing report has been submitted as per Sections 26 05 00 and 28 31 00.
8. Start-up reports from factory representative have been submitted as per Section 26 05 00.

Accepted by:

Prime Contractor _____________________________________________

By ___________________________________ Date __________________

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

* * * * *
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical demolition

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.

B. Where walls, ceilings, structures, etc., are indicated as being removed on general or electrical drawings, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, raceways, wiring, systems, etc., from the removed area.

C. Where mechanical or technology equipment is indicated as being removed on electrical, mechanical, or technology drawings, the Contractor shall be responsible for disconnecting the equipment and removing all starters, VFD, controllers, electrical equipment, raceways, wiring, etc. associated with the device.

D. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities and equipment that will remain in operation following demolition. Extension of conduit and wire to equipment shall be compatible with the surrounding area. Extended conduit and conductors to match existing size and material.

E. Coordinate scope of work with all other Contractors and the Owner at the project site. Schedule removal of equipment and electrical service to avoid conflicts.

F. Bid submittal shall mean the Contractor has visited the project site and has verified existing conditions and scope of work.

3.2 PREPARATION

A. The Contractor shall obtain approval from the Owner before turning off power to circuits, feeders, panels, etc. Coordinate all outages with Owner.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.
C. Disconnect electrical systems in walls, floors, structures, and ceilings scheduled for removal.

D. Existing Electrical Service: Maintain existing system in service.

E. Existing Fire Alarm System: Maintain existing system in service.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of Division 1 of Specifications and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring and raceway to source of supply. Existing conduit in good condition may be reused in place by including an equipment ground conductor in reused conduit. Reused conduit and boxes shall have supports revised to meet current codes. Relocating conduit shall not be allowed.

D. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated clamps, hangers, supports, etc. associated with raceway removal.

E. Disconnect and remove outlets and devices that are to be demolished. Remove conduit, supports, and conductors back to source. Devices’ back box and conduit mounted in walls that are to remain can be abandoned in place. Provide appropriate cover plate for all abandoned back boxes, matching cover plate material specified on project material list.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Repair adjacent construction and finishes damaged during demolition and extension work. Patch openings to match existing surrounding finishes.

H. Maintain access to existing electrical installations that remain active. Modify installation or provide junction boxes and access panel as appropriate.

I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. Extended conduit and conductors to match existing size and material.

J. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

3.4 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 1 of Specifications.
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Building wire

1.2 REFERENCES
A. NEMA WC 70 - Power Cables Rated 2,000V or Less for the Distribution of Electrical Energy
B. UL 44 – Thermoset-Insulated Wires and Cables
C. UL 83 – Thermoplastic-Insulated Wires and Cables
D. UL 854 – Service-Entrance Cables
E. UL 1581 – Standard for Electrical Wires, Cables, and Flexible Cords

PART 2 - PRODUCTS

2.1 BUILDING WIRE
A. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, THHN/THWN or XHHW-2.
B. Feeders and Branch Circuits Larger than 6 AWG in Underground Conduit: Copper, stranded conductor, 600 volt insulation, THWN.
C. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation, THHN/THWN. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid or stranded conductor, unless otherwise noted on the drawings.
D. Motor Feeder from Variable Frequency Drives: Copper conductor, 600 volt XHHW-2 insulation, stranded conductor, unless otherwise noted on the drawings.
E. Control Circuits: Copper, stranded conductor 600 volt insulation, THHN/THWN.
F. Each 120 and 277 volt branch circuit shall have a dedicated neutral conductor. Neutral conductors shall be considered current-carrying conductors for wire derating.

PART 3 - EXECUTION

3.1 WIRE AND CABLE INSTALLATION SCHEDULE
A. Above Accessible Ceilings: Building wire in raceways.
B. All Other Locations: Building wire in raceway.
C. Above Grade: All conductors installed above grade shall be type “THHN”.
D. Underground or In Slab: All conductors shall be type “THWN”.

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3.2 CONTRACTOR CHANGES

A. The basis of design is copper conductors installed in raceway based on ambient temperature of 30°C, NEC Table 310.16.

B. The Contractor shall be responsible for derating and sizing conductors and conduits to equal or exceed the ampacity of the basis of design circuits, if he/she chooses to use methods or materials other than the basis of design.

C. Underground electrical duct ampacity rating shall be in accordance with NEC Table B.310.15(B)(2)(7) or calculated in accordance with Annex B Application Information for Ampacity Calculation. The calculations and a sketch of the proposed installation shall be submitted prior to any conduit being installed.

D. Record drawing shall include the calculations and sketches.

3.3 GENERAL WIRING METHODS

A. Use no wire smaller than 12 AWG for power circuits, and no smaller than 14 AWG for control wiring.

B. Use no wire smaller than 18 AWG for low voltage control wiring (<100 volts).

C. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet, and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

D. Use no wire smaller than 8 AWG for outdoor lighting circuits.

E. The ampacity of multiple conductors in one conduit shall be derated per National Electrical Code, Article 310. In no case shall more than 4 conductors be installed in one conduit to such loads as motors larger than 1/4 HP, panelboards, motor control centers, etc.

F. Where installing parallel feeders, place an equal number of conductors for each phase of a circuit in same raceway or cable.

G. Splice only in junction or outlet boxes.

H. Neatly train and lace wiring inside boxes, equipment, and panelboards.

I. Make conductor lengths for parallel circuits equal.

J. All conductors shall be continuous in conduit from last outlet to their termination.

K. Terminate all spare conductors on terminal blocks, and label the spare conductors.

L. Cables or wires shall not be laid out on the ground before pulling.

M. Cables or wires shall not be dragged over earth or paving.

N. Care shall be taken so as not to subject the cable or wire to high mechanical stresses that would cause damage to the wire and cable.

O. At least six (6)-inch loops or ends shall be left at each outlet for installation connection of luminaires or other devices.
P. All wires in outlet boxes not connected to fixtures or other devices shall be rolled up, spliced if continuity of circuit is required, and insulated.

3.4 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Pulling shall be continuous without unnecessary stops and starts with wire or cable only partially thru raceway.

D. Where reels of cable or wire are used, they shall be set up on jacks close to the point where the wire or cable enters the conduit or duct so that the cable or wire may be unreeled and run into the conduit or duct with a minimum of change in the direction of the bend.

E. Conductors shall not be pulled through conduits until plastering or masonry work is completed and conduits are free from moisture. Care shall be taken so that long pulls of wire or pulls around several bends are not made where the wire may be permanently stretched and the insulation damaged.

F. Only nylon rope shall be permitted to pull cables into conduit and ducts.

G. Completely and thoroughly swab raceway system before installing conductors.

3.5 WIRING CONNECTIONS AND TERMINATIONS

A. Splice and tap only in accessible junction boxes.

B. Use solderless, tin-plated copper, compression terminals (lugs) applied with circumferential crimp for copper conductor terminations, 8 AWG and larger.

C. Use solderless, tin-plated, compression terminals (lugs) applied with indenter crimp for copper conductor terminations, 10 AWG and smaller.

D. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.

E. Use copper, compression connectors applied with circumferential crimp for copper wire splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

F. Thoroughly clean wires before installing lugs and connectors.

G. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

H. Phase Sequence: All apparatus shall be connected to operate in the phase sequence A-B-C representing the time sequence in which the phase conductors so identified reach positive maximum voltage.
I. As a general rule, applicable to switches, circuit breakers, starters, panelboards, switchgear and the like, the connections to phase conductors are intended thus:

1. Facing the front and operating side of the equipment, the phase identification shall be:

   a. Left to Right - A-B-C
   b. Top to Bottom - A-B-C

J. Connection revisions as required to achieve correct rotation of motors shall be made at the load terminals of the starters or disconnect switches.

3.6 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 1.

B. Building Wire and Power Cable Testing: Test shall be made by means of an insulation testing device such as a “Megger” using not less than 500 volts D.C. test potential.

C. Inspect wire and cable for physical damage and proper connection.

D. Torque test conductor connections and terminations to manufacturer’s recommended values.

E. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

END OF SECTION
SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Equipment grounding system
   B. Bonding system

1.2 QUALITY ASSURANCE
   A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   B. Comply with UL 467 Grounding and Bonding Equipment.
   C. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

1.3 SUMMARY
   A. This section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

PART 2 - PRODUCTS

2.1 GROUNDING CONDUCTORS
   A. For insulated conductors, comply with Division 26 Section 26 05 13 "Wire and Cable".
   B. Material: Copper.
   C. Equipment Grounding Conductors: Insulated with green-colored insulation.
   D. Sizes and types below are typical. Adjust to suit Project conditions and requirements.
   E. Copper Bonding Conductors: As follows:
      1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch in diameter.
      2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
      3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
      4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTOR PRODUCTS
   A. Comply with UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
B. Connectors: Hydraulic compression type, in kit form, and selected per manufacturer’s written instructions.

C. Bolted Connectors: Bolted-pressure-type connectors.

PART 3 - EXECUTION

3.1 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvantically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.

2. Make connections with clean, bare metal at points of contact.


5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer’s published torque-tightening values. If manufacturer’s torque values are not indicated, use those specified in UL 486A.

F. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.2 INSTALLATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage. Each grounding conductor that passes through a below grade wall must be provided with a waterstop.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then use a bolted clamp. Bond straps directly to the basic structure, taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. In raceways, use insulated equipment grounding conductors.

3.3 EQUIPMENT GROUNDING SYSTEM

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits. Terminate each end on a grounding lug or bus.

3.4 BONDING SYSTEM

A. At building expansion joints, provide flexible bonding jumpers to connect to columns or beams on each side of the expansion joint.

B. Isolated Equipment Enclosure: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate equipment bonding conductor.

C. Exterior Metallic Pull and Junction Box Covers, Metallic Hand Rails: Bond to grounding system using flexible grounding conductors.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Rigid metallic conduit and fittings
B. Electrical metallic tubing and fittings
C. Flexible metallic conduit and fittings
D. Liquidtight flexible metallic conduit and fittings
E. Wall and ceiling outlet boxes
F. Electrical connection
G. Pull and junction boxes
H. Rough-ins
I. Accessories

1.2 REFERENCES

A. American National Standards Institute (ANSI):
   1. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated
   2. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated and Fittings
   3. ANSI C80.4 - Fittings for Rigid Metal Conduit and Electrical Metallic Tubing
   4. ANSI C80.6 – Intermediate Metal Conduit, Zinc Coated
   5. ANSI/NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
   6. ANSI/NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports

B. Federal Specifications (FS):
   1. A–A–50553A – Fittings for Conduit, Metal, Rigid, (Thick-Wall and Thin-Wall (EMT) Type
   2. A–A–55810 – Specification for Flexible Metal Conduit

C. NECA "Standards of Installation"

D. National Electrical Manufacturers Association (NEMA):
   1. ANSI/NEMA FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable
   2. RN 1 – Polyvinyl chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

E. National Fire Protection Association (NFPA):
   1. ANSI/NFPA 70 – National Electrical Code

F. Underwriters Laboratories (UL): Applicable Listings
   1. UL 1 – Flexible Metal Conduit
   2. UL 6 – Rigid Metal Conduit
   3. UL 360 – Liquid Tight Flexible Steel Conduit
   4. UL514-B – Conduit Tubing and Cable Fittings
   5. UL797 – Electrical Metal Tubing
   6. UL1242 – Intermediate Metal Conduit
G. Definitions:

1. Fittings: Conduit connection or coupling.
2. Body: Enlarged fittings with opening allowing access to the conductors for pulling purposes only.
3. Mechanical Spaces: Enclosed areas, usually kept separated from the general public, where the primary use is to house service equipment and to route services. These spaces generally have exposed structures, bare concrete and non-architecturally emphasized finishes.
4. Finished Spaces: Enclosed areas where the primary use is to house personnel and the general public. These spaces generally have architecturally emphasized finishes, ceilings and/or floors.
5. Concealed: Not visible by the general public. Often indicates a location either above the ceiling, in the walls, in or beneath the floor slab, in column coverings, or in the ceiling construction.
6. Above Grade: Not directly in contact with the earth. For example, an interior wall located at an elevation below the finished grade shall be considered above grade but a wall retaining earth shall be considered below grade.
7. Slab: Horizontal pour of concrete used for the purpose of a floor or sub-floor.

PART 2 - PRODUCTS

2.1 RIGID METALLIC CONDUIT (RMC) AND FITTINGS

A. Acceptable Manufacturers:


B. Minimum Size Galvanized Steel: 3/4 inch (19mm), unless otherwise noted.

C. Fittings and Conduit Bodies:

1. End Bell Fittings: Malleable iron, hot dip galvanized, threaded flare type with provisions for mounting to form.

2. Expansion Joints: Malleable iron and hot dip galvanized providing a minimum of 4 inches of movement. Fitting shall be watertight with an insulating bushing and a bonding jumper.

3. Expansion Joint for Concrete Encased Conduit: Neoprene sleeve with bronze end coupling, stainless steel bands and tinned copper braid bonding jumper. Fittings shall be watertight and concrete-tight.

4. Conduit End Bushings: Malleable iron type with molded-on high impact phenolic thermosetting insulation. Where required elsewhere in the contract documents,
bushing shall be complete with ground conductor saddle and clamp. **High impact phenolic threaded type bushings are not acceptable.**

5. All other fittings and conduit bodies shall be of malleable iron construction and hot dip galvanized.

D. PVC Externally Coated Conduit: Compliant with UL 6, ANSI C80.1 and NEMA RN 1; rigid galvanized steel conduit with external 40 mil PVC coating and internal 2 mil urethane coating surface. All fittings and conduit bodies shall be complete with coating. Threads shall be hot galvanized and coated with a clear coat of urethane. The PVC coated system shall include necessary PVC coated fittings, boxes and covers to form a complete encapsulated system. Acceptable Manufacturers: Robroy, T&B Ocal or approved equal.

2.2 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

A. Minimum Size Electrical Metallic Tubing: 3/4 inch, unless otherwise noted.

B. Acceptable Manufacturers of EMT Conduit: Allied, LTV, Steelduct, Wheatland Tube Co, or approved equal.

C. Fittings and Conduit Bodies:
   1. 2" Diameter or Smaller: Compression insulated-throat type of steel designed for their specific application.
   2. Larger than 2": Compression insulated-throat type of steel designed for their specific application.

2.3 FLEXIBLE METALLIC CONDUIT (FMC) AND FITTINGS

A. Minimum Size Galvanized Steel: 3/4 inch, unless otherwise noted. Lighting branch circuit wiring to an individual luminaire may be a manufactured, UL listed 3/8” flexible metal conduit with #14 AWG THHN conductors and an insulated ground wire.

B. Acceptable Manufacturers: American Flex, Alflex, Electri-Flex Co, or approved equal.

C. Construction: Flexible steel, approved for conduit ground, zinc coated, threadless type formed from a continuous length of spirally wound, interlocked zinc coated strip steel. Provide a separate equipment grounding conductor when used for equipment where flexibility is required.

D. Fittings and Conduit Bodies:
   1. Threadless hinged clamp type, galvanized zinc coated cadmium plated malleable cast iron.
   2. Fittings and conduit bodies shall include plastic or cast metal inserts supplied by the manufacturer to protect conductors from sharp edges.
2.4 LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC) AND FITTINGS

A. Acceptable Manufacturers: Anaconda Type UA, Electri-Flex Type LA, Alflex, Carlon (Lamson & Sessions), or approved equal.

B. Construction: Flexible steel, approved for conduit ground, zinc coated, threadless type formed from a continuous length of spirally wound, interlocked zinc coated strip steel and an extruded PVC cover.

C. Fittings and Conduit Bodies:
   1. Watertight, compression type, galvanized zinc coated cadmium plated malleable cast iron, UL listed.
   2. Fittings and conduit bodies shall include plastic or cast metal inserts supplied by the manufacturer to protect conductors from sharp edges.
   3. Acceptable Manufacturers: Appleton Electric, O-Z/Gedney Co., Electroline, Bridgeport, Thomas & Betts, Midwest, Regal, Carlon (Lamson & Sessions), or approved equal.

2.5 OUTLET BOXES

A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1; galvanized steel, minimum of 14 gauge, with 1/2 inch male fixture studs where required.

B. Cast Boxes: NEMA FB1, Type FD, Aluminum or cast feralloy, deep type, gasketed cover, threaded hubs.

C. Wall or column receptacle outlet boxes shall be 4 inches square with raised cover to fit flush with finished wall line. Boxes in concrete block walls shall be installed the same as for switch boxes in block walls.

2.6 [ECONN]: ELECTRICAL CONNECTION

A. Electrical connection to equipment and motors, sized per NEC. Coordinate requirements with contractor furnishing equipment or motor. Refer to specifications and general installation notes for terminations to motors.

2.7 [JB]: PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: ANSI/NEMA OS 1; galvanized steel.

B. Sheet metal boxes larger than 12 inches in any dimension that contain terminations or components: Continuous hinged enclosure with 1/4 turn latch and white back panel for mounting terminal blocks and electrical components.

C. Cast Metal Boxes for Outdoor and Wet Location Installations: NEMA 250; Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron box and cover with ground flange, neoprene gasket, and stainless steel cover screws.

D. Flanged type boxes shall be used where installed flush in wall.
PART 3 - EXECUTION

3.1 CONDUIT SIZING

A. Size conduit as shown on the drawings and specifications. Where not indicated in the contract documents, conduit size shall be according to N.E.C. (Latest Edition). Conduit and conductor sizing shall be coordinated to limit conductor fill to less than 40%, maintain conductor ampere capacity as required by the National Electrical Code (to include enlarged conductors due to temperature and quantity derating values) and to prevent excessive voltage drop and pulling tension due to long conduit/conductor lengths.

B. Minimum Conduit Size (Unless Noted Otherwise):

1. Above Grade: 3/4 inch. (The use of 1/2 inch would be allowed for installation conduit to individual light switches, individual receptacles and individual fixture whips from junction box.)

2. Telecommunication Conduit: 1 inch.

3. Controls Conduit: 1/2 inch.

C. Conduit sizes shall change only at the entrance or exit to a junction box, unless specifically noted on the drawings.

3.2 CONDUIT ARRANGEMENT

A. In general, conduit shall be installed concealed in walls, in finished spaces and where possible or practical, or as noted otherwise. In unfinished spaces, mechanical and utility areas, conduit may run either concealed or exposed as conditions dictate and as practical unless noted otherwise on drawings. Installation shall maintain headroom in exposed vicinities of pedestrian or vehicular traffic.

B. Conduit shall not share the same cell as structural reinforcement in masonry walls.

C. Conduit runs shall be routed as shown on large scale drawings. Conduit routing on drawings scaled 1/4”=1'-0" or less shall be considered diagrammatic, unless noted otherwise. The correct routing, when shown diagrammatically shall be chosen by the Contractor based on information in the contract documents, in accordance with manufacturer's written instructions, applicable codes, the NECA's "Standard of Installation", in accordance with recognized industry standards, and coordinated with other contractors.

D. Contractor shall adapt his work to the job conditions and make such changes as required and permitted by the Architect/Engineer, such as moving to clear beams and joists, adjusting at columns, avoiding interference with windows, etc., to permit the proper installation of other mechanical and/or electrical equipment.

E. Contractor shall cooperate with all Contractors on the project. He shall obtain details of other Contractor's work in order to ensure fit and avoid conflict. Any expense due to the failure of This Contractor to do so shall be paid for in full by him. The other trades involved as directed by the Architect/Engineer shall perform the repair of work damaged as a result of neglect or error by This Contractor. The resultant costs shall be borne by This Contractor.
3.3 **CONDUIT SUPPORT**

A. Conduit runs installed above a suspended ceiling shall be properly supported. In no case shall conduit rest on the suspended ceiling construction, nor utilize ceiling support system for conduit support.

B. Conduit shall not be supported from ductwork, water, sprinkler piping, or other non-structural members, unless approved by the Architect/Engineer. All supports shall be from structural slabs, walls, structural members, and bar joists, and coordinated with all other applicable contractors, unless noted otherwise.

C. Conduit shall be held in place by the correct size of galvanized one-hole conduit clamps, two-hole conduit straps, patented support devices, clamp back conduit hangers, or by other means if called for on the drawings.

D. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

E. Spring-steel conduit clips specifically designed for supporting single conduits or tubing may be used in lieu of malleable-iron hangers for 1" and smaller raceways serving lighting and receptacle branch circuits above accessible ceilings and for securing raceways to slotted channel and angle supports.

F. Group conduits in parallel runs where practical and use conduit racks or trapeze hangers constructed of steel channel, suspended with threaded solid rods or wall mounted from metal channels with conduit straps or clamps. Provide space in each rack or trapeze for 25% additional conduits.

G. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (excludes concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and mechanical items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Supports for metallic conduit shall be no greater than 10 feet. A smaller interval may be used if necessitated by building construction, but in no event shall support spans exceed the National Electrical Code requirements. Conduit shall be securely fastened within 3 feet of each outlet box, junction box, device box, cabinet, or fitting.

J. Supports of flexible conduit shall be within 12 inches of each outlet box, junction box, device box, cabinet, or fitting and at intervals not to exceed 4.5 feet.

K. Where conduit is to be installed in poured concrete floors or walls, provide concrete-tight conduit inserts securely fastened to forms to prevent conduit misplacement.

L. Finish:
   1. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and above suspended ceiling spaces are not considered exposed.
   2. Trim all ends of exposed field fabricated steel hangers, slotted channel and threaded rod to within 1" of support or fastener to eliminate potential injury to
3.4 CONDUIT INSTALLATION

A. Conduit Connections:

1. Shorter than standard conduit lengths shall be cut square using industry standards. The ends of all conduits cut shall be reamed or otherwise finished to remove all rough edges.

2. Metallic conduit connections in slab on grade installation shall be sealed and one coat of rust inhibitor primer applied after the connection is made.

3. Where conduits with tapered threads cannot be coupled with standard couplings, then approved split or Erickson couplings shall be used. Running threads will not be permitted.

4. Install expansion/deflection joints where conduit crosses structure expansion/seismic joints.

B. Conduit terminations for all low voltage wiring shall have nylon bushings installed on each end of every conduit run.

C. Conduit Bends:

1. Use a hydraulic one-shot conduit bender or factory elbows for bends in conduit 2" in size or larger. All steel conduit bending shall be done cold; no heating of steel conduit shall be permitted.

2. A run of conduit shall not contain more than the equivalent of four (4) quarter bends (360°), including those bends located immediately at the outlet or body.

3. Telecommunications conduits shall have no more than two (2) 90 degree bends between pull points and contain no continuous sections longer than 100 feet. Insert pull points or pull boxes for conduits exceeding 100 feet in length.

a. A third bend is acceptable if:
   1) The total run is not longer than (33) feet.
   2) The conduit size is increased to the next trade size.

4. Telecommunications pull boxes shall not be used in lieu of a bend. Align conduits that enter into the pull box from opposite ends with each other. Pull box size shall be twelve (12) times the diameter of the largest conduit. Slip sleeves or gutters can be used in place of a pull box.

5. Telecommunications conduit bend radius shall be six (6) times the diameter for conduits under 2" and ten (10) times the diameter for conduits over 2".

6. Use conduit bodies to make sharp changes in direction (i.e. around beams).

D. Conduit Placement:

1. Conduit shall be mechanically continuous from source of current to all outlets. Conduit shall be electrically continuous from source of current to all outlets,
unless a properly sized grounding conductor is routed within the conduit. All metallic conduits shall be bonded per the National Electrical Code.

2. Route exposed conduit and conduit above suspended ceilings (accessible or not) parallel/perpendicular to the building structural lines, and as close to building structure as possible. Wherever possible, route horizontal conduit runs above water and steam piping.

3. Route conduit through roof openings provided for piping and ductwork where possible. If not provided or routing through provided openings is not possible, route through roof jack with pitch pocket. Coordinate roof penetrations with other trades.

4. Conduits, raceway, and boxes shall not be installed in concealed locations in metal deck roofing or less than 1.5" below bottom of roof decking.

5. Avoid moisture traps where possible. Where unavoidable, provide a junction box with drain fitting at conduit low point.

6. All conduits through walls shall be grouted or sealed into openings. Where conduit penetrates firewalls and floors, seal with a UL listed sealant. Seal penetrations with intumescent caulk, putty, or sheet installed per manufacturer's recommendations. All materials used to seal penetrations of firewalls and floors shall be tested and certified as a system per ASTM E814 Standard for fire tests or through-penetration fire stops as manufactured by 3M or approved equal.

7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN MASONRY OR EXTERIOR WALLS UNDER THIS DIVISION. A QUALIFIED MASON AT THE EXPENSE OF THIS CONTRACTOR SHALL REPAIR ALL OPENINGS TO MATCH EXISTING CONDITIONS.

8. Seal interior of conduit at exterior entries, air handling units, coolers/freezers, etc., and where the temperature differential can potentially be greater than 20°F, to prevent moisture penetration. Seal shall be placed where conduit enters warm space. Conduit seal fitting shall be a drain/seal, with sealing compound, equal to O-Z/Gedney type EYD.

9. Contractor shall provide suitable mechanical protection around all conduits stubbed out from floors, walls or ceilings during construction to prevent bending or damaging of stubs due to carelessness with construction equipment.

10. Contractor shall provide a polypropylene pull cord with 2000 lbs. tensile strength in each empty conduit (indoor and outdoor), except in sleeves and nipples.

3.5 CONDUIT TERMINATIONS

A. Where conduit bonding is indicated or required in the contract documents, the bushings shall be a grounding type sized for the conduit and ground bonding conductor as manufactured by O-Z/Gedney, Appleton, Thomas & Betts, Burndy, Regal, or approved equal.

B. Conduits with termination fittings shall be threaded for one (1) lock nut on the outside and one (1) lock nut and bushing on the inside of each box.
C. Where conduits terminate in boxes with knockouts, they shall be secured to the boxes with lock nuts and provided with approved screw type tinned iron bushings or fittings with plastic inserts.

D. Where conduits terminate in boxes, fittings, or bodies with threaded openings, they shall be tightly screwed against the shoulder portion of the threaded openings.

E. Conduit terminations to all motors shall be made with flexible metallic conduit (FMC), unless noted otherwise. Final connections to roof exhaust fans, or other exterior motors and motors in damp or wet locations shall be made with liquidtight flexible metallic conduit (LFMC). Motors in hazardous areas, as defined in the National Electrical Code, shall be connected using flexible conduit rated for the environment. Flexible conduit shall not exceed 6’ in length. Route equipment ground conductors from circuit ground to motor ground terminal through flexible conduit.

F. Rigid polyvinyl chloride conduit (PVC) shall be terminated using fittings and bodies produced by the manufacturer of the conduit, unless noted otherwise. Prepare conduit as per manufacturer’s recommendations before joining. All joints shall be solvent welded by applying full even coat of plastic cement to the entire areas that will be joined. Turn the conduit at least a quarter to one half turn in the fitting and let the joint cure for 1-hour minimum or as per the manufacturer’s recommendations.

G. All conduit ends shall be sealed with plastic immediately after installation to prevent the entrance of any foreign matter during construction. The seals shall be removed and the conduits blown clear of any and all foreign matter prior to any wires or pull cords being installed.

3.6 CONDUIT INSTALLATION SCHEDULE

A. In the event the location of conduit installation represents conflicting installation requirements as specified in the following schedule, a clarification shall be obtained from the Architect/Engineer. If This Contractor is unable to obtain a clarification as outlined above, concealed rigid galvanized steel conduit installed per these specifications and the National Electrical Code shall be required.

B. The following schedule shall be adhered to unless they constitute a violation of applicable codes or are noted otherwise on the drawings. The installation of RMC conduit will be permitted in place of any and all conduit specified in this schedule.

1. Exposed:
   a. Switchboards, panel feeders, etc.: IMC.
   b. Branch Circuits (lighting, receptacles, controls, etc.): EMT.
   c. Mechanical Equipment Feeders (pumps, AHU’s, chillers, etc.): IMC.
   d. Controls: EMT painted blue or dyed blue.

2. Finished Spaces/Concealed: EMT.

3. Wet or Damp Locations: RMC conduit, boxes and fittings, installed and equipped so as to prevent water from entering the conduit system.
4. Interior Locations:
   a. Exposed: EMT conduit.
      1) Exposed Controls Conduit: EMT painted blue or dyed blue.
   b. Concealed: EMT.

3.7 BOX INSTALLATION SCHEDULE

A. Galvanized steel boxes may be used in:
   1. Concealed interior locations above ceilings and in hollow studded partitions.
   2. Exposed interior locations in mechanical rooms and in rooms without ceilings; higher than 8’ above the highest platform level.
   3. Direct contact with concrete except slab on grade.
   4. Recessed in stud wall of kitchens and laundries.

B. Cast boxes shall be used in:
   1. Exterior locations.
   2. Exposed interior locations within 8’ of the highest platform level.
   3. Wet locations.

3.8 COORDINATION OF BOX LOCATIONS

A. Provide electrical boxes as shown on the drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

B. Electrical box locations shown on the Contract Drawings are approximate, unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.

C. Locate and install boxes to allow access. Avoid interferences with ductwork, piping, structure, equipment, etc. Where installation is inaccessible, provide access doors. Coordinate locations and sizes of required access doors with the Architect/Engineer and General Contractor.

D. Locate and install to maintain headroom and to present a neat appearance.

E. Coordinate locations with Heating Contractor to avoid baseboard radiation cabinets.

3.9 OUTLET BOX INSTALLATION

A. The Contractor shall anchor switch and outlet box to wall construction so that it is flush with the finished masonry, paneling, drywall, plaster, etc. The Contractor shall check the boxes as the finish wall surface is being installed to assure that the box is flush. (Provide plaster rings as necessary.)

B. Mount at heights shown or noted on the drawings or as generally accepted if not specifically noted.

C. Locate boxes in masonry walls to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat openings for boxes.

D. Provide knockout closures for unused openings.
E. Support boxes independently of conduit.

F. Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems.

G. Install boxes in walls without damaging wall insulation.

H. Coordinate mounting heights and locations of outlets mounted above counters, benches, backsplashes, and below baseboard radiation.

I. Position outlets to locate luminaires as shown on reflected ceiling drawings.

J. In inaccessible ceiling areas, position outlets and junction boxes within 6 inches of recessed luminaire, to be accessible through luminaire ceiling opening.

K. Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately positioned to allow for surface finish thickness. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.

L. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

M. Provide cast outlet boxes in exterior locations and wet locations, and where exposed rigid or intermediate conduit is used.

3.10 PULL AND JUNCTION BOX INSTALLATION

A. Locate pull boxes and junction boxes above accessible ceilings or in unfinished areas.

B. Support pull and junction boxes independent of conduit.

C. Do not install boxes back-to-back in walls.
   1. Provide a minimum horizontal separation of 6 inches between boxes installed on opposite sides of non-rated stud walls.
   2. Provide a minimum horizontal separation of 24 inches between boxes installed on opposite sides of fire-rated walls. When the minimum separation cannot be maintained, install fire-rated moldable pads to all five sides of the back box to maintain the fire rating of the wall. Install moldable pads in accordance with UL listing for the specific product. Sound insulation pads are not acceptable for use in fire-rated wall applications unless the product carries the necessary fire rating.

D. Install sound insulation pads on all five sides of the back of all boxes in sound-rated wall assemblies. Sound-rated wall assemblies are defined as partition types carrying a Sound Transmission Class (STC) rating.

3.11 EXPOSED BOX INSTALLATION

A. Boxes shall be secured to the building structure with proper size screws, bolts, hanger rods, or structural steel elements.

B. On brick, block and concrete walls or ceilings, exposed boxes shall be supported with no less than two (2) Ackerman-Johnson, Paine, Phillips, or approved equal screw anchors or expansion shields and round head machine screws. Cast boxes shall not be drilled.
C. On steel structures, exposed boxes shall be supported to the steel member by drilling and tapping the member and fastening the boxes by means of round head machine screws.

D. Boxes may be supported on steel members by APPROVED beam clamps if conduit is supported by beam clamps.

E. Boxes shall be fastened to wood structures by means of a minimum of two (2) wood screws adequately large and long to properly support. (Quantity depends on size of box.)

F. Wood, plastic, or fiber plugs shall not be used for fastenings.

G. Explosive devices shall not be used unless specifically allowed.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Nameplates and tape labels
B. Wire and cable markers
C. Conduit labeling
D. Conductor color coding
E. Electrical gear labeling

1.2 REFERENCES

B. NFPA 70 – National Electrical Code
C. ANSI A13.1 – Standard for Pipe Identification
D. ANSI Z535.4 – Standard for Product Safety Signs and Labels

PART 2 - PRODUCTS

2.1 ELECTRICAL IDENTIFICATION PRODUCTS

A. Colored Adhesive Marking Tape for banding Raceways, Wires, and Cables: Self-adhesive vinyl tape not less than 3 mils thick by 1 inch to 2 inches in width.

B. Pretensioned Flexible Wraparound Colored Plastic Sleeves for Cable Identification: flexible acrylic bands sized to suit the cable diameter and arranged to stay in place by pre-tensioned gripping action when coiled around the cable.

C. Wire/Cable Designation Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable/conductor markers with preprinted numbers and letter.

D. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a temperature range from minus 50°F to 350°F. Provide ties in specified colors when used for color coding.

E. Indoor/Outdoor Number and Letters: Outdoor grade vinyl label, minimum of 3/4” high x 9/16” wide, with acrylic adhesive designed for permanent application in severe indoor and outdoor environments.

2.2 NAMEPLATES AND SIGNS

A. Engraved, Plastic-Laminated Labels, Signs and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Labels shall be punched for mechanical fasteners. Engraving legend shall be as follows:

1. Black letters on white face for normal power.
2. White letters on red face for emergency power.
3. White letters on green face for grounding.
B. Baked–Enamel Signs for interior Use: Preprinted aluminum signs, punched, or drilled for fasteners, with colors, legend, and size required for application. Mounting ¼” grommets in corners.

C. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with .0396 inch galvanized-steel backing: and with colors, legend, and size required for application. Mounting ¼” grommets in corners.


E. Fasteners for Plastic-Laminated Signs; Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

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 required by code.

B. Install identification devices in accordance with manufacturer’s written instruction and requirements of NEC.

C. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work. All mounting surfaces shall be cleaned and degreased prior to identification installation.

D. Identify Junction, Pull and Connection Boxes: Labeling shall be 3/8-inch Kroy tape or Brother self-laminating vinyl label, color-coded same as conduits or permanent magic marker (color coded), neatly hand printed.

E. Circuit Identification: Tag or label conductors as follows:

1. Multiple Power or Lighting Circuits in Same Enclosure: Where multiple branch circuits are terminated or spliced in a box or enclosure, label each conductor with source and circuit number.

2. Multiple Control Wiring and Communication/Signal Circuits in Same Enclosure: For control and communications/signal wiring, use wire/cable marking tape at terminations in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tape.

3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility’s electrical installations.

F. Apply warning, caution and instruction signs as follows:

1. Install warning, caution or instruction signs where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. Emergency Operating Signs: Install, where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect, engraved laminate signs with white legend on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, or other emergency operations.

G. Apply circuit/control/item designation labels of engraved plastic laminate for pushbuttons, pilot lights, alarm/signal components, and similar items, except where labeling is specified elsewhere.

H. Install labels parallel to equipment lines at locations as required and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

I. Install ARC FLASH WARNING signs on all switchboards, panelboards, industrial control panels, and motor control centers. Sign at a minimum shall contain:

![WARNING](image)

3.2 Switch and Receptacle Cover Plates

A. Provide identification on all switch and receptacle cover plates. Identification shall indicate source and circuit number serving the device (i.e. “C1A #24”).

B. Identification material to be a clear, 3/8-inch Kroy tape or Brother self-laminating vinyl label with black letters in normal size “Swiss 721 Bold” font. Letter and number size to 3/16-inch high. Embossed Dymo-Tape labels are not acceptable. Permanently affix identification label to cover plates, centered above the receptacle openings.

3.3 Box Labeling

A. All junction, pull, and connection boxes shall be identified as follows:

1. For power and lighting circuits, indicate system voltage and identity of contained circuits (“120V, 1LA1-3,5,7”).

2. For other wiring, indicate system type and description of wiring (“FIRE ALARM NAC #1”).

3.4 Conductor Color Coding

A. Color coding shall be applied at all panels, switches, junction boxes, pull boxes, vaults, manholes etc., where the wires and cables are visible and terminations are made. The same color coding shall be used throughout the entire electrical system, therefore maintaining proper phasing throughout the entire project.
B. Where more than one nominal voltage system exists in a building or facility, the identification of color coding used in the panelboard or equipment shall be permanently posted on the interior of the door or cover.

C. All wires and cables, 6 AWG or larger, used in motor circuits, main feeders, sub-main feeders and branch circuits, shall be coded by the application of plastic tape. The tape shall be 3-M, Plymouth or Permacel, in colors specified below. The tape shall be applied at each conductor termination with two 1-inch tape bands at 6-inch centers. Contractor option to use colored cabling in lieu of the tape at each end for conductor 6 AWG to 500 KCM.

D. Wire and cables smaller than 6 AWG shall be color coded by the manufacturer.

E. Colored cable ties shall be applied in groups of three ties of specified color to each conductor at each terminal or splice point starting 3 inches from the termination and spaced at 3-inch centers. Tighten to a snug fit, and cut off excess length.

F. Where more than one nominal voltage system exists in a building or facility, each ungrounded conductor of a multi-wire branch circuit, where accessible, shall be identified by phase and system.

G. Conductors shall be color coded as follows:

   1. 208Y/120 Volt, 4-Wire:
      a. A-Phase – Black
      b. B-Phase – Red
      c. C-Phase – Blue
      d. Neutral – White
      e. Ground Bond – Green

   2. 480Y/277 Volt, 4-Wire:
      a. A-Phase – Brown
      b. B-Phase – Orange
      c. C-Phase – Yellow
      d. Neutral – Gray
      e. Ground Bond – Green

3.5 ELECTRICAL GEAR LABELING

A. Exterior electrical gear shall be identified with vinyl label names and numbers to be visible on the exterior of the gear. The labels shall correspond to the 1-line nomenclature and identify each cubicle of multi-section gear.

3.6 CONTROL EQUIPMENT IDENTIFICATION

A. Provide identification on the front of all control equipment, such as disconnect switches, starters, VFDs, contactors, motor control centers, etc. Nameplate text shall be a minimum of 1/4" high.

B. Labeling shall include:

   1. Equipment type and contract documents designation of equipment being served.
   2. Location of equipment being served if it is not located within sight.
   3. Voltage and phase of circuit(s).
4. Panel and circuit number(s) serving the equipment.
5. Method of automatic control, if included ("AUTO CONTROL BY FCMS").

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<tr>
<th>EXHAUST FAN EF-1 (&quot;LOCATED ON ROOF&quot;)</th>
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<tr>
<td>480V, 3-PHASE</td>
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<td>FED FROM &quot;1HA1-1&quot;</td>
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END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. The General and Supplementary Conditions of the Construction Contract and Division 1 - General Requirements apply to the Work specified in this Section.
B. This section includes the engineering, furnishing, and installing of steel helical piles.
C. Structural notes indicated on the drawings regarding helical piles shall be considered part of this specification.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified.

1. ASTM A29/A29M Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished.
2. ASTM A36/A36M Structural Steel.
3. ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
4. ASTM A153 Zinc Coating (Hot Dip) on Iron and Steel Hardware.
5. ASTM A252 Welded and Seamless Steel Pipe Piles.
6. ASTM A775 Electrostatic Epoxy Coating
7. ASTM A193/A193M Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service.
8. ASTM A320/A320M Alloy-Steel Bolting Materials for Low Temperature Service.
10. ASTM A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A536 Standard Specifications for Ductile Iron Castings
14. ASTM A618 Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.
15. ASTM A656 Hot-Rolled Structural Steel, High-Strength Low-Alloy Plate with Improved Formability.
17. ASTM A1018 Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability.
18. AWS D1.1 Structural Welding Code – Steel.

B. Qualifications:

1. Installation shall be done by a contractor with a minimum of 5 years of experience installing helical piles. A list of 5 recent projects shall be submitted prior to starting installation.
2. The engineer preparing design calculations, shop drawings, and other structural data for the helical piles shall be a registered Structural engineer in the state where the project is located, with not less than three (3) years of continuous experience in design work of similar scope to that shown on the drawings.
3. Special Inspector shall keep a record or log of each pile as installed. Records shall show location, top and bottom elevations, torque data, date installed, type of strata encountered, and any other pertinent information. A copy of this record shall be submitted to the Architect and Structural Engineer for their record files.


1.3 DESIGN REQUIREMENTS

A. Helical piles shall be designed to support the nominal compressive/tensile load(s) as shown on the project plans. The overall length, helix configuration and minimum torsional resistance of a helical pile shall be such that the required geotechnical capacity is developed by the helix plate(s) in an appropriate bearing stratum.

B. All steel structure pile components shall be designed within the limits provided by the American Institute of Steel Construction (AISC). Either Allowable Stress Design (ASD) or Load & Resistance Factor Design (LRFD) are acceptable methods of analysis. Product testing in accordance with ICC-ES Acceptance Criteria 358 may also be considered as an acceptable means of establishing allowable system capacities.

C. Except where noted otherwise on the project plans, all piles shall be installed to provide a minimum factor of safety against ultimate bearing resistance of 2. Piles must satisfy the deflection criteria stated on the plans or drawings.

D. Except where noted otherwise on the project plans, each pile shall be designed to meet a corrosion service life of 50 years in accordance with ICC-ES Acceptance Criteria 358.

E. The pile design shall take into account such pile spacing, corrosion and strain compatibility issues as are present for the project.

F. Geotechnical information is unknown for the project. Helical pile design can consider common soil stratifications for the area or be based on torsional resistance only.

1.4 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete detailed shop drawings for Engineer’s approval. Shop drawings shall indicate the following:
   a. Layout of helical pile locations.
   b. Provide calculations of pile design and layout, prepared, signed and sealed by a registered professional engineer, with registration from the state in which the building is located.

2. Certification from the pile designer that the proposed piles meet the requirements of this Specification.

3. Qualifications of pile installer.

4. Qualifications of pile designer.

5. Type and size of central steel shaft.

6. Helix configuration (number and diameter of helix plates).

7. Product designations for helix and extension sections and all ancillary products to be supplied at each helical pile location.

8. Individual pile nominal loads.

9. Individual pile loading requirements (if any).

10. Manufacturer’s published allowable system capacities for the pile assemblies, including load transfer devices.

11. Calculated theoretical geotechnical capacity of piles.

12. Minimum torsional resistance criteria.


14. Minimum embedment lengths and such other site specific embedment depth requirements as may be appropriate for the site soil profiles.
15. Inclination angle and location tolerance requirements.

16. Copies of certified calibration reports for torque measuring equipment and load test measuring equipment to be used on the project. The calibrations shall have been performed within one year of the proposed starting date for helical pile installation or as recommended by the equipment manufacturer based on the proposed starting date.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Steel shafts shall be transported, stored and installed in a manner that will avoid any damage or deformation. Materials should be stored to allow easy access for inspection and identification. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of the ground and in such a manner as to eliminate excessive handling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conventional Solid Bar Steel Helical Piles:

1. Pile Shafts (Lead Section and Extensions)

a. The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be Type SS (Square Shaft) or RS (Round Shaft) or a combination of the two (SS to RS Combo Pile)

b. Type RS2875 2-7/8" OD Material: Structural steel tube or pipe, welded or seamless, in compliance with ASTM A500 or A513. Wall thickness is 0.262".

c. Torque strength rating: RS2875.262 = 7,500 ft-lb.

d. Minimum yield strength = 50 ksi

e. Type RS3500 3-1/2" OD Material: Shall be structural steel tube or pipe, seamless or straight-seam welded, per ASTM A53, A252, ASTM A500, or ASTM A618. Wall thickness is 0.300" (schedule 80)

f. Torque strength rating = 13,000 ft-lb

2. Helices: Hot rolled carbon steel sheet, strip, or plate formed on matching metal dies to true helical shape, 0.5 inch (12.7 mm) thick, and shall conform to the following ASTM specifications:

a. RS2875 Material: Per ASTM A36, or A572, with minimum yield strength of 36 ksi. Plate thickness is 3/8" or ½".

b. RS3500 Material: Per ASTM A36, or A572, or A1018, or A656 depending on helix diameter, per the minimum yield strength requirements cited above. Plate thickness is 3/8" or ½".

3. Bolts: The sizes and types of bolts used to connect the helical pier extensions to lead sections or another extension shall conform to the following ASTM specifications:

a. RS2875 2-7/8" OD Material: 3/4" diameter bolts (2 or 4 per coupling) per SAE J429 Grade 5 or 8.

b. RS3500 3-1/2" OD Material: 3/4" diameter bolts (3 or 4 per coupling) per SAE J429 Grade 5 or 8.
4. Plate Caps: 1/2” thick A36 steel top plate welded to top of coupler with 1/4” fillet weld all around coupler. Coupler as compatible with pier shaft fastened to shaft with weld, bolt or epoxy.

5. Couplings: For Type RS2875, RS3500, and RS4500 material, the couplings shall either be formed as an integral part of the plain and helical extension material as hot forge expanded sockets, or as internal sleeve wrought steel connectors. The steel connectors can be either tubing or solid steel bar with holes for connecting shaft sections together.

6. Finish/Corrosion Protection: All steel material shall be hot dipped galvanized in accordance with ASTM A153 after fabrication.

PART 3 - EXECUTION

3.1 EQUIPMENT

A. Installation Equipment:

1. Shall be a rotary type motor with equal forward and reverse torque capabilities. This equipment shall be capable of continual adjustment of the torque drive unit’s revolutions per minute (RPM’s) during installation. Percussion drilling equipment will not be allowed.

2. Shall be capable of applying installation torque equal to the torque required to meet the tieback loads.

3. Equipment shall be capable of applying axial compression (crowd) pressure and torque simultaneously.

B. Torque Monitoring Devices:

1. The torque being applied by the installing units shall be monitored throughout the installation by the installer. The torque monitoring device shall either be a part of the installing unit or an independent device in-line with the installing unit. Calibration for either unit shall be available for review by the Owner.

2. Shall be capable of torque measurements in increments of at least 500 ft-lb.

3. Shall be calibrated prior to pre-production testing or start of work

3.2 PLACEMENT REQUIREMENTS

A. Helical piles shall be installed within 3 inches of the indicated plan location.

B. Helical pile shaft alignment shall be within 2 degrees of the inclination angle shown on the plans.

C. Top elevation of helical piles shall be within 2 inches of the design vertical elevation.

D. When pile placement is not shown on the project plans, the placements, alignments and their respective tolerances shall be included as part of the design submittal.

3.3 INSTALLATION PROCEDURES:

A. Advancing Sections:

1. Engage and advance the helical tieback sections in a smooth, continuous manner with the rate of pile rotation in the range of 5 to 35 RPM.

2. Apply sufficient axial compression (crowd) pressure to uniformly advance the helical sections to approximately 3-inches per revolution. The rate of rotation
and magnitude of crowd pressure must be adjusted for different soil conditions and depths in order to maintain the penetration rate.

3. If the helical section ceases to advance, refusal will have been reached and the installation shall be terminated.

4. Installation of helical piles may be observed by representatives of the Owner for quality assurance purposes. The installing contactor shall give the Owner’s Representative at least 24 hours prior notice of pile installation operations.

### 3.4 TERMINATION CRITERIA

**A.** The minimum overall length criteria and the minimum torsional resistance criteria as specified in the Pre-Construction Submittals must be satisfied prior to terminating the pile installation. In the event any helical pile fails to meet these production quality control criteria, the following prequalified remedies are authorized:

1. If the installation fails to meet the minimum torsional resistance criterion at the minimum embedment length:
   
   a. Continue the installation to greater depths until the torsional resistance criterion is met, provided that, if a maximum length constraint is applicable, continued installation does not exceed maximum length constraint.
   
   b. Demonstrate acceptable pile performance through proof testing.

2. If the torsional resistance during installation reaches the helical pile’s allowable torque rating prior to satisfaction of the minimum embedment length criterion:
   
   a. Terminate the installation at the depth obtained if load capacity exceeds specified values and can be verified by testing procedures.
   
   b. Replace the pile with one having a shaft with a higher torsional strength rating. This replacement pile must be installed to satisfy the minimum embedment length criterion. It must also be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pile without exceeding any applicable maximum embedment length requirements and it must meet the minimum torsional resistance criterion, or
   
   c. Replace the pile with one having a different helix configuration. This replacement pile must be installed to satisfy the minimum embedment length criterion. It must also be embedded to a length that places its last helix at least three times its own diameter beyond the position of the first helix of the replaced pile without exceeding any applicable maximum embedment length requirements, and it must meet the minimum torsional resistance criterion, or
   
   d. If allowed by the pile location tolerance or approved by the Owner’s Representative, remove and reinstall the pile at a position at least three times the diameter of the largest helix away from the initial location. Original embedment length and torsional resistance criteria must be met. This pile repositioning may require the installation of additional helical piles with nominal loads adjusted for these spacing changes.

3. If the installation reaches a specified maximum embedment length without achieving the minimum torsional resistance criterion:
   
   a. If allowed by the pile location tolerance or approved by the Owner’s Representative, remove and reinstall the pile at a position at least three times the diameter of the largest helix away from the initial location. Original embedment length and torsional resistance criteria must be met.
This pile repositioning may require the installation of additional helical piles with nominal loads adjusted for these spacing changes, or

b. Demonstrate acceptable pile performance through proof testing, or
c. De-rate the load capacity of the helical pile and install additional piles as necessary. The de-rated capacity and additional pile location shall be subject to the approval of the Owner’s Representative, or
d. Replace the pile with one having a different helix configuration. This replacement pile must be installed to satisfy the minimum embedment length criterion and it must meet the minimum torsional resistance criterion.

3.5 INSTALLATION RECORD SUBMITTALS

A. The Installing Contractor shall provide the Owner, or his authorized representative, copies of individual helical pile installation records within 24 hours after each installation is completed. Formal copies shall be submitted (insert time frequency). These installation records shall include, but are not limited to, the following information:

1. Date and time of installation
2. Location of helical pile
3. Actual helical pile type and configuration
4. Total length of installed pile
5. Actual inclination of the pile
6. Actual torsional resistance
7. Calculated geotechnical capacity based on actual torsional resistance
8. Comments pertaining to interruptions, obstructions, or other relevant information

3.6 CONFORMING SYSTEMS

A. Capacity: The final installed capacity of each pile many be determined by use of the “Torque Correlation Method following the criteria outlined in the ICC-AC358 – “Acceptance Criteria for Helical Pile Systems and Devices.”

END OF SECTION