BARTLETT REGIONAL HOSPITAL ROOF REPLACEMENT

VOLUME I OF II

Contract No. E11-286

File No. 1726



ENGINEERING DEPARTMENT

DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

BIDDING and CONTRACT REQUIREMENTS

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SECTION 00030 - NOTICE INVITING BIDS

OBTAINING CONTRACT DOCUMENTS. The Contract Documents are entitled:

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

The Contract Documents may be obtained at the CBJ Engineering Department, 3rd Floor Marine View Center, upon payment of **<u>\$50.00</u>** (non-refundable) for each set of Contract Documents (including Technical Specifications and Drawings.)

PRE-BID CONFERENCE. Prospective Bidders are encouraged to attend a Pre-Bid conference of the proposed WORK, which will be conducted by the OWNER and ARCHITECT, at 2:00 p.m. on May 27, 2011, in the Bartlett Regional Hospital, Robert F. Valliant, Administration Building, Board Room, 3260 Hospital Drive, Juneau, Alaska. The object of the conference is to acquaint Bidders with the bid documents and site conditions.

DESCRIPTION OF WORK. The project includes but is not limited removal of the existing IRMA roof system down to the structural roof deck; installation of a sloping, insulated fully adhered single ply roof membrane roofing system to drains, and mechanical and electrical modifications as described in the Contract Documents.

COMPLETION OF WORK. The WORK must be completed by the dates shown in the table below:

Work Description

Completion Date

1968 Roof, including mechanical and electrical	October 31, 2011
Substantial Completion of all remaining Work	July 31, 2012
Final Completion	August 31, 2012

DEADLINE FOR BIDS: Sealed bids must be received by the Purchasing Division <u>prior to 2:00 p.m.</u>, <u>Alaska Time on June 8, 2011</u>, or such later time as may be announced by addendum at any time prior to the deadline. Bids will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of bids. Bids will be opened immediately thereafter in the Assembly Chambers of the Municipal Building, 155 S. Seward Street, unless otherwise specified.

Bid documents delivered in person or by courier service must be delivered to:

PHYSICAL LOCATION:

City and Borough of Juneau, Purchasing Division 105 Municipal Way, Room 300 Juneau, AK 99801

Bid documents delivered by the U.S. Postal Service must be mailed to:

MAILING ADDRESS:

City and Borough of Juneau, Purchasing Division 155 South Seward Street Juneau, AK 99801

SECTION 00030 - NOTICE INVITING BIDS

Please affix the label below to outer envelope in the lower left hand corner.

IMPORTANT NOTICE TO BIDDER		
To submit	your Bid:	
1. Print yo	our company name and address on the uppe	r left corner
of your	envelope.	
2. Comple	ete this label and place it on the lower lef	t corner
of your	envelope.	
S	BID NUMBER:	
E	E11-286	В
Α		Ι
L	SUBJECT:	D
E	BARTLETT REGIONAL	
D	HOSPITAL ROOF	
	REPLACEMENT	
	DEADLINE DATE:	
	PRIOR TO 2:00PM ALASKA TIME	

Mailing/delivery times to Alaska may take longer than other areas of the U.S. Late bids will <u>not</u> be accepted and will be returned.

SITE OF WORK. The site of the WORK is Bartlett Regional Hospital, 3260 Hospital Drive, Juneau, Alaska.

BIDDING, CONTRACT, or TECHNICAL QUESTIONS. All communications relative to this WORK, prior to opening Bids, shall be directed to the following:

Jennifer Mannix, Contract Administrator CBJ Engineering Department, 3rd Floor, Marine View Center jennifer_mannix@ci.juneau.ak.us Telephone: (907) 586-0873 Fax: (907) 586-4530

BID SECURITY. Each Bid shall be accompanied by a certified or cashier's check or Bid Bond, in the amount of 5% percent of the Bid, payable to the City and Borough of Juneau, Alaska, as a guarantee that the Bidder, if its Bid is accepted, will promptly execute the Agreement. A Bid shall not be considered unless one of the forms of Bidder's security is enclosed with it.

CONTRACTOR'S LICENSE. All contractors are required to have a current Alaska Contractor's License, prior to submitting a Bid, and a current Alaska Business License prior to award.

BID TO REMAIN OPEN. The Bidder shall guarantee the Bid for a period of 90 Days from the date of Bid opening. Any component of the Bid may be awarded anytime during the 90 Days.

OWNER'S RIGHTS RESERVED. The OWNER reserves the right to reject any or all Bids, to waive any informality in a Bid, and to make award to the lowest responsive, responsible Bidder as it may best serve the

SECTION 00030 - NOTICE INVITING BIDS

interests of the OWNER.

OWNER: City and Borough of Juneau

Date

1.0 DEFINED TERMS. Terms used in these Instructions to Bidders and the Notice Inviting Bids, which are defined in the General Conditions, have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to the OWNER, as distinct from a sub-bidder, who submits a Bid to a Bidder.

2.0 INTERPRETATIONS AND ADDENDA.

- A. INTERPRETATIONS. All questions about the meaning or intent of the Contract Documents are to be directed to the Engineering Contracts Administrator. Interpretations or clarifications considered necessary by the Engineering Contracts Administrator in response to such questions will be issued by Addendum, mailed, faxed, or delivered to all parties recorded by the Engineering Contracts Administrator, or OWNER, as having received the Contract Documents. Questions received less than seven Days prior to the Deadline for Bids may not be answered. Only questions answered by formal written Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.
- B. ADDENDA. Addenda may be issued to modify the Contract Documents as deemed advisable by the OWNER. Addenda may be faxed or, if addendum format warrants, addenda may be posted to the CBJ Engineering Department website. In any event, notification of addendum issuance will be faxed to planholders. Hard copies are available upon request. The OWNER will make all reasonable attempts to ensure that all planholders receive notification of Addenda, however, it is strongly recommended by the OWNER that bidders independently confirm the contents, number, and dates of each Addendum prior to submitting a Bid.
- **3.0 FAIR COMPETITION**. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the OWNER believes that any Bidder is interested in more than one Bid for the WORK contemplated, all Bids in which such Bidder is interested will be rejected. If the OWNER believes that collusion exists among the Bidders, all Bids will be rejected.
- **4.0 RESPONSIBLE BIDDER**. Only responsive Bids from responsible Bidders will be considered. A Bid submitted by a Bidder determined to be not responsible may be rejected. A responsible Bidder is one who is considered to be capable of performing the WORK.
 - 1. financial resources
 - 2. ability to meet delivery standards
 - 3. past performance record
 - a. References from others on contractor's performance
 - b. Record of performance on prior OWNER contracts
 - 4. record of integrity
 - 5. obligations to OWNER
 - a. Bidders must be registered as required by law and in good standing for all amounts owed to the OWNER within ten Days of OWNER's Notice of Intent to Award.

- b. City and Borough of Juneau (CBJ) Finance Department, Treasury Division administers the registration and assessment of sales, business personal property and business real property taxes.
- A. Special standards for responsibility, if applicable, will be specified. These special standards establish minimum standards or experience required for a responsible Bidder on a specific contract.
- B. Before a Bid is considered for award, a Bidder may be requested to submit information documenting its ability and competency to perform the WORK, according to general standards of responsibility and any special standards which may apply. It is Bidder's responsibility to submit sufficient, relevant, and adequate information. OWNER will make its determination of responsibility and has no obligation to request clarification or supplementary information.
- **5.0 NON-RESPONSIVE BIDS**. Only responsive Bids will be considered. Bids may be considered non-responsive and may be rejected. Some of the reasons a Bid may be rejected for being non-responsive are:
 - A. If a Bid is received by the CBJ Purchasing Division after the Deadline for Bids.
 - B. If the Bid is on a form other than that furnished by the OWNER, or legible copies thereof; or if the form is altered or any part thereof is detached; or if the Bid is improperly signed.
 - C. If there are unauthorized additions, conditional or alternate Bids, or irregularities of any kind which may tend to make the bid incomplete, indefinite, ambiguous as to its meaning, or in conflict with the OWNER's Bid document.
 - D. If the Bidder adds any unauthorized conditions, limitations, or provisions reserving the right to accept or reject any award, or to enter into a contract pursuant to an award. This does not exclude a Bid limiting the maximum gross amount of awards acceptable to any one Bidder at any one Bid opening, provided that any selection of awards will be made by the OWNER.
 - E. If the Bid does not contain a Unit Price for each pay item listed, except in the case of authorized alternate pay items.
 - F. If the Bidder has not acknowledged receipt of each Addendum.
 - G. If the Bidder fails to furnish an acceptable Bid guaranty with the Bid.
 - H. If any of the Unit Prices Bid are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the OWNER.
 - I. If a Bid modification does not conform to Article 15.0 of this Section.
- 6.0 **BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE**. It is the responsibility of each Bidder before submitting a Bid:
 - A. To examine thoroughly the Contract Documents, and other related data identified in the Bidding documents (including "technical data" referred to below):

- 1. To visit the site to become familiar with and to satisfy the Bidder as to the general and local conditions that may affect cost, progress, or performance, of the WORK,
- 2. To consider federal, state and local laws and regulations that may affect cost, progress, or performance of the WORK,
- 3. To study and carefully correlate the Bidder's observations with the Contract Documents, and other related data; and
- 4. To notify the ARCHITECT of all conflicts, errors, or discrepancies in or between the Contract Documents and such other related data.

7.0 REFERENCE IS MADE TO THE SUPPLEMENTARY GENERAL CONDITIONS FOR IDENTIFICATION OF:

- A. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the Architect of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such reports, however, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with non-technical data, interpretations, and opinions contained therein or the completeness thereof is the responsibility of the Bidder.
- B. Those Drawings of physical conditions in or relating to existing surface and subsurface conditions (except underground utilities) which are at or contiguous to the site have been utilized by the Architect of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such Drawings, however, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with nontechnical data, interpretations, and opinions contained in such Drawings or the completeness thereof is the responsibility of the Bidder.
- C. Copies of such reports and Drawings will be made available by the OWNER to any Bidder on request if said reports and Drawings are not bound herein. Those reports and Drawings are not part of the Contract Documents, but the technical data contained therein upon which the Bidder is entitled to rely, as provided in Paragraph SGC-4.2 of the Supplementary General Conditions, are incorporated herein by reference.
- D. Information and data reflected in the Contract Documents with respect to underground utilities at or contiguous to the site is based upon information and data furnished to the OWNER and the Architect of Record by the owners of such underground utilities or others, and the OWNER does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary General Conditions, or in Section 01530 Protection and Restoration of Existing Facilities of the General Requirements.
- E. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground utilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2, 4.3, and 4.4 of the General Conditions.
- F. Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface,

and underground utilities) at or contiguous to the site or otherwise which may affect cost, progress, or performance of the WORK and which the Bidder deems necessary to determine its Bid for performing the WORK in accordance with the time, price, and other terms and conditions of the Contract Documents.

- G. On request in advance, the OWNER will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and shall clean up and restore the site to its former condition upon completion of such explorations.
- H. The lands upon which the WORK is to be performed, rights-of-way and easements for access thereto and other lands designated for use by the CONTRACTOR in performing the WORK are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the OWNER unless otherwise provided in the Contract Documents.
- I. The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of Article 6.0, "Bidder's Examination of Contract Documents and Site" herein, that without exception the Bid is premised upon performing the WORK required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the WORK.

8.0 BID FORM.

- A. The Bid shall be made on the Bid Schedule(s) bound herein, or on the yellow Bid packet provided, or on legible and complete copies thereof, and shall contain the following: Sections 00300, 00310, the required Bid Security, and any other documents required in Section 00300 Bid.
- B. All blanks on the Bid Form and Bid Schedule must be completed in ink or typed.
- C. Bids by corporations must be executed in the corporate name by the president, a vice-president (or other corporate officer). The corporate address and state of incorporation must appear below the signature.
- D. Bids by partnerships must be executed in the partnership name and be signed by a managing partner, and the official address of the partnership must appear below the signature.
- E. The Bidder's Bid must be signed. All names must be printed or typed below the signature.
- F. The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid form. <u>Failure to acknowledge Addenda may render Bid</u> <u>non-responsive and may cause its rejection</u>.
- G. The address to which communications regarding the Bid are to be directed must be shown.

- **9.0 QUANTITIES OF WORK**. The quantities of WORK, or material, stated in Unit Price items of the Bid are supplied only to give an indication of the general scope of the WORK; the OWNER does not expressly or by implication agree that the actual amount of WORK, or material, will correspond therewith, and reserves the right after award to increase or decrease the amount of any Unit Price item of the WORK by an amount up to and including 25 percent of any Bid item, without a change in the Unit Price, and shall include the right to delete any Bid item in its entirety, or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Contract Price (see Section 00700 General Conditions, Article 10 Changes In the WORK).
- **10.0 SUBSTITUTE OR "OR-EQUAL" ITEMS.** The procedure for the submittal of substitute or "or-equal" products is specified in Section 013300 Submittal Procedures.
- **11.0 SUBMISSION OF BIDS**. The Bid shall be delivered by the time and to the place stipulated in Section 00030 Notice Inviting Bids. It is the Bidder's sole responsibility to see that its Bid is received in proper time. <u>Oral, telegraphic, emailed, or faxed Bids will not be considered</u>. The envelope enclosing the sealed Bids shall be plainly marked in the upper left-hand corner with the name and address of the Bidder and shall also include the label included in Section 00030 Notice Inviting Bids. The Bid Security shall be enclosed in the same envelope with the Bid
- **12.0 BID SECURITY, BONDS, AND INSURANCE**. Each Bid shall be accompanied by a certified, or cashier's check, or approved Bid Bond in an amount of at least 5 percent of the total Bid price. The "total Bid price" is the amount of the Base Bid, plus the amount of alternate Bids, if any, which total to the maximum amount for which the CONTRACT could be awarded. Said check or Bond shall be made payable to the OWNER and shall be given as a guarantee that the Bidder, if offered the WORK, will enter into an Agreement with the OWNER, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said Bonds, if required, and insurance amounts shall be as stated in the Supplementary General Conditions. In case of refusal or failure to enter into said Agreement, the check or Bid Bond as its Bid security, the Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bid Bonds must be accompanied by a legible Power of Attorney.
- **13.0 RETURN OF BID SECURITY.** The OWNER will return all Bid security checks (certified or cashier's) accompanying such of the Bids as are not considered in making the award. All other Bid securities will be held until the Agreement has been executed. Following execution of the Agreement, all other Bid security checks will be returned to the respective Bidders whose Bids they accompanied and Bid security bonds will be appropriately discarded.
- **14.0 DISCREPANCIES IN BIDS**. In the event there is more than one Pay Item in a Bid Schedule, the Bidder shall furnish a price for all Pay Items in the schedule, and failure to do so may render the Bid non-responsive and cause its rejection. In the event there are Unit Price Pay Items in a Bid Schedule and the "amount" indicated for a Unit Price Bid Item does not equal the product of the Unit Price and quantity, the Unit Price shall govern and the amount will be corrected accordingly, and the Bidder shall be bound by said correction. In the event there is more than one Pay Item in a Bid Schedule and the total indicated for the schedule does not agree with the sum of the prices Bid on the individual items, the prices Bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Bidder shall be bound by said correction.

15.0 BID MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS.

A. Any bidder may deliver a modification to a bid in person, by mail or fax (907-586-4561), provided that such modification is received by the Purchasing Division no later than the deadline for bids. Modifications will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of the modification. The modification must not reveal the bid price but should be in the form of an addition or subtraction or other modification so that the final prices will not be known until the sealed bid is opened.

The Bid modifications shall be provided on the **Bid Modification Form** located at the end of this Section. Submittal of any other form by the vendor may deem the modification unacceptable by the OWNER **A mail or fax modification should not reveal the Bid price but should provide the addition or subtraction or other modification so that the final prices will not be known by the City and Borough until the sealed Bid is opened.** Submitted Modification forms shall include the modification to the unit price or lump sum amount of each pay item modified.

FAX DISCLAIMER: It is the responsibility of the bidder to submit modifications in a timely manner. Bidders' use of a fax machine to modify their bid shall be at bidders' sole risk. The Purchasing Division will attempt to keep the fax machine in good working order but will not be responsible for bid modifications that are late due to mechanical failure, a busy fax machine, or any other cause arising from bidder's use of a fax machine, even if bidder submits a transmission report or provides other confirmation indicating that the bidder transmitted a bid modification prior to the deadline. The City will not be responsible for its failure to receive the modification whether such failure is caused by equipment or human error, or otherwise. Bidders are therefore strongly encouraged to confirm receipt of their bid modification with the Purchasing Division (907-586-5258) prior to deadline.

- B. <u>Conditioned bids, limitations, or provisos attached to the Bid or bid modification will</u> render it unauthorized and cause its rejection as being non-responsive. The completed Bid forms shall be without interlineations, alterations, or erasures in the printed text. All changes shall be initialed by the person signing the Bid. Alternative Bids will not be considered unless called for.
- **16.0 WITHDRAWAL OF BID**. Prior to the Deadline for Bids, the Bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of Bids.

17.0 AWARD OF CONTRACT.

A. Award of a contract, if it is awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Technical Specifications and will be made to the lowest responsive, responsible Bidder whose Bid complies with all the requirements prescribed. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the Bids are to remain open. Unless otherwise indicated, a single award will be made for all the Bid items in an individual Bid Schedule.

B. If the OWNER has elected to advertise this Project with a Bid and Alternate Bid. The OWNER may elect to award the contract for the Bid, or the Alternate Bid. In either case, award shall be made to the responsive, responsible bidder offering the lowest total Bid for the WORK to be awarded.

18.0 EXECUTION OF AGREEMENT.

- A. All Bids of value greater than \$1,000,000 must be approved by the CBJ Assembly. After the CBJ Assembly has approved the award and after the Bid protest period, the OWNER will issue a Notice of Intent to Award to the approved Bidder. The Bidder to whom award is made shall execute a written Agreement with the OWNER on the Agreement form, Section 00500, collect insurance, and shall furnish all certificates and Bonds required by the Contract Documents within 10 Days (calendar) from the date of the Notice of Intent to Award letter.
- B. Failure or refusal to enter into the Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder. Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the OWNER.
- **19.0 LIQUIDATED DAMAGES.** Provisions for liquidated damages if any, are set forth in Section 00500 Agreement.

20.0 FILING A PROTEST.

- A. A Bidder may protest the proposed award of a competitive sealed Bid by the City and Borough of Juneau. The protest shall be executed in accordance with CBJ Ordinance 53.50.062 PROTESTS and CBJ Ordinance 53.50.080 ADMINISTRATION OF PROTEST. The entire text of the CBJ Purchasing Ordinance can be accessed at the CBJ website, *http://www.juneau.org/law/code/code.php*, or call the CBJ Purchasing Division at (907) 586-5258 for a copy of the ordinance.
- B. Late protests shall not be considered by the CBJ Purchasing Officer.
- 21.0 JUNEAU BUSINESS SALES AND PERSONAL PROPERTY TAX: Vendors/merchants conducting business within the City are required by law to register with, and periodically report to, the City for sales and property taxes. <u>CONTRACTORs and Subcontractors must be in good standing with the City prior to award, and prior to any contract renewals, and in any event no later than ten Days (calendar) following notification by the City of intent to award. Good standing means: all amounts owed to the City are paid in full, including Confession of Judgments; and vendor/merchant is current in reporting (sales tax filings, business personal property declarations). Failure to meet these requirements, if so subject, may be cause for rejection of your bid. To determine if your business is in good standing, or for further information, contact the City Finance Department's Sales Tax Division, at (907) 586-5265, concerning sales tax and/or Treasury Division, at (907) 586-5268, concerning business personal property and real property tax.</u>

22.0 PERMITS AND LICENSES. The CONTRACTOR is responsible for all WORK associated with meeting any local, state, and/or federal permit and licensing requirements.

CITY AND BOROUGH OF JUNEAU PURCHASING DIVISION FAX NO. 907-586-4561

BID MODIFICATION FORM

Modification Number: _____

Note: All modifications shall be made to the original bid amount(s). If more than one Modification form is submitted by any one bidder, changes from all Modification forms submitted will be combined and applied to the original bid. Changes to the modified Bid amounts will be calculated by the OWNER.

PAY ITEM NO.	PAY ITEM DESCRIPTION	MODIFICATIONS TO UNIT PRICE OR LUMP SUM (indicate +/-)

Total Increase or Decrease: <u>\$</u>

Name of Bidding Firm

Responsible Party Signature

Printed Name (must be an authorized signatory for Bidding Firm)

BID TO: THE CITY AND BOROUGH OF JUNEAU

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the OWNER in the form included in the Contract Documents (as defined in Article 7 of Section 00500 - Agreement) to perform the WORK as specified or indicated in said Contract Documents entitled

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

- 2. Bidder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the "Notice Inviting Bids" and "Instructions to Bidders," dealing with the disposition of the Bid Security.
- 3. This Bid will remain open for the period of time stated in the "Notice Inviting Bids" unless otherwise required by law. Bidder will enter into an Agreement within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders," and will furnish insurance certificates, Payment Bond, Performance Bond, and any other documents as may be required by the Contract Documents.
- 4. Bidder has familiarized itself with the nature and extent of the Contract Documents, WORK, site, locality where the WORK is to be performed, the legal requirements (federal, state and local laws, ordinances, rules, and regulations), and the conditions affecting cost, progress or performance of the WORK and has made such independent investigations as Bidder deems necessary.
- 5. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.
- 6. To all the foregoing, and including all Bid Schedule and information required of Bidder contained in this Bid Form, said Bidder further agrees to complete the WORK required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the total bid price(s) named in the aforementioned Bid Schedule.
- 7. Bidder has examined copies of all the Contract Documents including the following Addenda (receipt of all of which is hereby acknowledged by the Undersigned):

Addenda No.	Date Issued

Addenda No.	Date Issued

Give number and date of each addenda above. Failure to acknowledge receipt of all Addenda may cause the Bid to be non-responsive and may cause its rejection.

BRH ROOF REPLACEMENT CBJ Contract No. E11-286 BID Page 00300-1 8. The Bidder has read this Bid and agrees to the conditions as stated herein by signing his/her signature in the space provided below.

Dated:	Bidder:	(Company Name)
Alaska CONTRACTOR's Business License No:	By: _	(Signature)
Alaska CONTRACTOR's	Printed Name:	
License No:	Title:	
Telephone No:	Address:	
Fax No:		(Street or P.O. Box)
	_	(City, State, Zip)

9. <u>TO BE CONSIDERED, ALL BIDDERS MUST COMPLETE AND INCLUDE THE FOLLOWING</u> <u>AT THE TIME OF THE BID OPENING</u>:

- Bid, Section 00300 (includes addenda receipt statement)
- Completed Bid Schedule, Section 00310
- Bid Security (Bid Bond, Section 00320, or by a certified or cashier's check as stipulated in the Notice Inviting Bids, Section 00030)
- 10. The apparent low Bidder is required to complete and submit the following documents by 4:30 p.m. on the *fifth business day* following the date of the Posting Notice.
 - Subcontractor Report, Section 00360

The apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in Section 00360 – Subcontractor Report will be found to be not a responsible Bidder and may be required to forfeit the Bid security. The OWNER will then consider the next lowest Bidder for award of the contract.

- 11. The successful Bidder will be required to submit, within <u>ten Days (calendar)</u> after the date of the "Notice of Intent to Award" letter, the following executed documents:
 - Agreement Forms, Section 00500
 - Performance Bond, Section 00610
 - Payment Bond, Section 00620
 - Certificates of Insurance, (CONTRACTOR) Section 00700 and Section 00800

SECTION 00310 - BID SCHEDULE

Bid Schedule for construction of <u>E11-286 named Bartlett Regional Hospital Roof Replacement</u>, in accordance with the Contract Documents. Low Bidder will be determined on the basis of the lowest Total Bid.

BID - Furnish all labor, equipment and materials and perform all WORK to remove Existing IRMA Roof System down to roof deck. Replace 90 mil (145 mil FleeceBack total thickness) Insulated Roof System on roofs of 1968 and 1987 Buildings as indicated on the Architectural, Mechanical, and Electrical drawings and as specified in Section 075323.01 – Ethylene-Propylene-Diene-Monomer (EPDM) Roofing.

TOTAL BID

\$_____(Price in Figures)

Date:

Bidder:

(Company Name)

SECTION 00320 - BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that_____

as Principal, and

as Surety, are held and firmly bound unto THE CITY AND BOROUGH OF JUNEAU hereinafter called "OWNER," in the sum of

dollars, (not less than five percent of the total amount of the Bid) for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under the Bid Schedule of the OWNER's Contract Documents entitled

BARTLETT REGIONAL HOSPITAL ROOF REPLACEMENT

CBJ Contract No. E11-286

NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders" enters into a written Agreement on the form of Agreement bound with said Contract Documents, furnishes the required certificates of insurance, and furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit, including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this ______ day of _____, 20____.

(SEAL)_____(Principal)

(SEAL)_____(Surety)

By:______(Signature)

By:_____(Signature)

SECTION 00360 - SUBCONTRACTOR REPORT

LIST OF SUBCONTRACTORS (AS 36.30.115)

1

The apparent low Bidder must submit a list of Subcontractors that the Bidder proposes to use in the performance of this contract on the fifth business day following the Posting Notice of Bids. If the fifth day falls on a weekend or holiday, the report is due by close of business on the next business Day following the weekend or holiday. The Subcontractor Report list must include each Subcontractor's name, address, location, evidence of valid Alaska Business License, and valid Alaska Contractor's Registration under AS 08.18. If no Subcontractors are to be utilized in the performance of the WORK, write in ink or type "NONE" on line (1) below

	SUBCONTRACTOR	¹ AK Contractor <u>License No.</u> ² AK Business	¹ Contact Name ² Phone No.	<u>Type of</u> <u>Work</u>	<u>Contract</u> <u>Amount</u>	✓ if <u>DBE</u>
1		<u>License No.</u>			\$	_
2		1 2			\$	
3		1 2			\$	_
4		1 2			\$	_

I certify that the above listed Alaska Business License(s) and CONTRACTOR Registration(s), if applicable, were valid at the time Bids were opened for this Project.

CONTRACTOR, Authorized Signature

CONTRACTOR, Printed Name

COMPANY

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

SECTION 00360 - SUBCONTRACTOR REPORT

- A. A Bidder may replace a listed Subcontractor if the Subcontractor:
 - 1. fails to comply with AS 08.18;
 - 2. files for bankruptcy or becomes insolvent;
 - 3. fails to execute a contract with the Bidder involving performance of the WORK for which the Subcontractor was listed and the Bidder acted in good faith;
 - 4. fails to obtain bonding;
 - 5. fails to obtain insurance acceptable to the OWNER;
 - 6. fails to perform the contract with the Bidder involving work for which the Subcontractor was listed;
 - 7. must be substituted in order for the CONTRACTOR to satisfy required state and federal affirmative action requirements;
 - 8. refuses to agree or abide with the Bidder's labor agreement; or
 - 9. is determined by the OWNER not to be responsible.
- B. If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of WORK, the Bidder shall be considered to have agreed to perform that portion of WORK without the use of a Subcontractor and to have represented the Bidder to be qualified to perform that WORK.
- C. A Bidder who attempts to circumvent the requirements of this section by listing as a Subcontractor another contractor who, in turn, sublets the majority of the WORK required under the contract violates this section.
- D. If a contract is awarded to a Bidder who violates this section, the OWNER may:
 - 1. cancel the contract; or
 - 2. after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the subcontract at issue.
- E. On the Subcontractor Report, the apparent low Bidder must list any Subcontractors anticipated to perform WORK with a value of greater than one-half of one percent of the intended award amount, or \$2,000, whichever is less.
- F. An apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in this section will be found to be not a responsible Bidder and may be required to forfeit the Bid security. The OWNER will then consider the next lowest Bidder for award of the contract.

SECTION 00500 - AGREEMENT

THIS AGREEMENT is between <u>THE CITY AND BOROUGH OF JUNEAU</u> (hereinafter called OWNER) and ______ (hereinafter called CONTRACTOR) OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR shall complete the WORK as specified or as indicated under the Bid Schedule of the OWNERS Contract Documents <u>Contract No. E11-286, named Bartlett Regional Hospital Roof</u> <u>Replacement.</u>

The WORK is generally described as follows: The project includes but is not limited removal of the existing IRMA roof system down to the structural roof deck; installation of a sloping, insulated fully adhered single ply roof membrane roofing system to drains, and mechanical and electrical modifications as described in the Contract Documents.

The WORK to be paid under this contract shall include the following: Total Bid as shown in Section 00310 - Bid Schedule.

ARTICLE 2. CONTRACT COMPLETION TIME.

Work Description	Completion Date
1968 Roof, including mechanical and electrical	October 31, 2011
Substantial Completion of all remaining Work	July 31, 2012
Final Completion	August 31, 2012

ARTICLE 3. DATE OF AGREEMENT

The date of this agreement will be the date of the last signature on page three of this section.

ARTICLE 4. LIQUIDATED DAMAGES.

OWNER and the CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the WORK is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual damages suffered by the OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof, the OWNER and the CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) the CONTRACTOR shall pay the OWNER the amounts specified below for each Day that expires after the completion time(s) specified. The amount of liquidated damages specified is agreed to be a reasonable estimate based on all facts known as of the date of this Agreement.

Work Description	Completion Date	Liquidated Damages
Substantial Completion – 1968 Roof	October 31, 2011	\$1,000.00
Substantial Completion – 1987 Roof	July 31, 2012	\$1,000.00
Final Completion	August 31, 2012	\$500.00

ARTICLE 5. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the WORK in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule. The CONTRACTOR agrees to accept as full and complete payment for all WORK to be done in this contract for: <u>CBJ Contract E11-286, named</u> <u>Bartlett Regional Hospital Roof Replacement</u>, those Lump Sum amounts as set forth in the Bid Schedule in the Contract Documents for this Project.

The total amount of this contract shall be ______(\$____), except as adjusted in accordance with the provisions of the Contract Documents.

ARTICLE 6. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the ARCHITECT as provided in the General Conditions.

Progress payments will be paid in full in accordance with Article 14 of the General Conditions until ninety (90) percent of the Contract Price has been paid. The remaining ten (10) percent of the Contract Price may be retained, in accordance with applicable Alaska State Statutes, until final inspection, completion, and acceptance of the Project by the OWNER.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the WORK consist of this Agreement (pages 00500-1 to 00500-6, inclusive) and the following sections of the Contract Documents:

- Table of Contents (pages 00030-1 to 00030-2, inclusive).
- Notice Inviting Bids (pages 00030-1 to 00030-2, inclusive).
- Instructions to Bidders (pages 00100-1 to 00100-8, inclusive).
- ▶ Bid (pages 00300-1 to 00300-2, inclusive).
- Bid Schedule (pages 00310-1, inclusive).
- ▶ Bid Bond (page 00320-1, inclusive) or Bid Security.
- Subcontractor Report (pages 00360-1 to 00360-2, inclusive).
- Performance Bond (pages 00610-1 to 00610-2, inclusive).
- Payment Bond (pages 00620-1 to 00620-2, inclusive).
- Insurance Certificate(s).
- ▶ General Conditions (pages 00700-1 to 00700-44, inclusive).
- Supplementary General Conditions (pages 00800-1 to 00800-5, inclusive).
- Alaska Labor Standards, Reporting, and Prevailing Wage Determination (page 00830-1).
- > Technical Specifications as listed in the Table of Contents.
- > Drawings consisting of 31 sheets, as listed in the Table of Contents.
- Addenda numbers ______ to _____, inclusive.
- Change Orders which may be delivered or issued after the Date of the Agreement and which are not attached hereto.

There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.3 of the General Conditions.

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

SECTION 00500 - AGREEMENT

ARTICLE 8. MISCELLANEOUS.

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents. This Agreement shall be governed by the laws of the State of Alaska. Jurisdiction shall be in the State of Alaska, First Judicial District.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have caused this Agreement to be executed on the date listed below signed by OWNER.

OWNER:	CONTRACTOR:
City and Borough of Juneau	(Company Name)
(Signature)	(Signature)
By: <u>Rod Swope, City Manager</u> (Printed Name)	By: (Printed Name, Authority or Title)
Date:	Date: (CONTRACTOR Signature Date)
OWNER's address for giving notices: <u>155 South Seward Street</u>	CONTRACTOR's address for giving notices:
Juneau, Alaska 99801	
907-586-0873 907-586-4530 (Telephone) (Fax)	(Telephone) (Fax)
	(E-mail address)
	CONTRACTOR License No.

CERTIFICATE (if Corporation)

STATE OF)) SS: COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the

_____a corporation existing under the laws of the State of ______, held on ______, 20____, the following resolution was duly passed and adopted:

"RESOLVED, that ______, as _____President of the Corporation, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this corporation and that the execution thereof, attested by the Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed of this Corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the

corporation this _____ day of _____, 20____.

Secretary

(SEAL)

CERTIFICATE (if Partnership)

STATE OF)) SS: COUNTY OF)

I HEREBY CERTIFY that a meeting of the Partners of the

a partnership existing under the laws of the State

of ______, held on ______, 20____, the following resolution was duly passed and adopted:

"RESOLVED, that ______, as _____ of the Partnership, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this partnership and that the execution thereof, attested by the ______ shall be the official act and deed of this Partnership."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20_____.

Secretary

(SEAL)

CERTIFICATE (if Joint Venture)

STATE OF)) SS: COUNTY OF)

I HEREBY CERTIFY that a meeting of the Principals of the

______a joint venture existing under the laws of the State of ______, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that ______, as ______ of the Joint Venture, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this joint venture and that the execution thereof, attested by the _______ shall be the official act and deed of this Joint Venture."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20____.

Secretary

(SEAL)

SECTION 00610 - PERFORMANCE BOND

		(intuine of contributer only	
a			
	(Co	rporation, Partnership, Individual)	
her	einafter called "Principal" and		
	-	(Surety)	
of	, State of	hereinafter called the "Surety", are held and firmly bound	d
to	the CITY AND BOROUGH of JUNEA	U, ALASKA hereinafter called "OWNER", for the penal sum	ı
	(Owner)` (City a	and State)	
of		dollars (\$) in	n
law	ful money of the United States, for the pa	ayment of which sum well and truly to be made, we bind ourselves	3,
our	heirs, executors, administrators and suc	cessors, jointly and severally, firmly by these presents.	

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is (CBJ Contracts Office to fill in effective date) ______, a copy of which is hereto attached and made a part hereof for the construction of:

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

NOW, THEREFORE, if the Principal shall truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof, which may be granted by the OWNER, with or without notice to the Surety, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

SECTION 00610 - PERFORMANCE BOND

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: _____

(Signature)

(Printed Name)

(Company Name)

(Street or P.0. Box)

(City, State, Zip Code)

SURETY:

By:

(Signature of Attorney-in-Fact)

(Printed Name)

(Company Name)

(Street or P.0. Box)

(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, <u>all</u> Partners must execute bond.

Date Issued:

SECTION 00620 - PAYMENT BOND

KNOW A	LL PERSONS BY THESE	PRESENTS: That we
		(Name of CONTRACTOR)
	a	
		(Corporation, Partnership, Individual)
hereinafter called	"Principal" and	
	•	(Surety)
of	, State of	hereinafter called the "Surety," are held and
firmly bound to <u>th</u>	e CITY AND BOROUGH ((Owner)	of JUNEAU, ALASKA hereinafter called "OWNER," for the (City and State)
penal sum of		Dollars
(\$) in lawful mo ade, we bind ourselves, our	oney of the United States, for the payment of which sum well heirs, executors, administrators and successors, jointly and
THE CON	NDITION OF THIS OBLIGA	ATION is such that Whereas, the CONTRACTOR has entered

into a certain contract with the OWNER, the effective date of which is (CBJ Contracts Office to fill in effective date) ______, a copy of which is hereto attached and made a part hereof for the construction of:

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for, or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said work, and for all labor performed in such WORK, whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

SECTION 00620 - PAYMENT BOND

Bartlett Regional Hospital Roof Replacement CBJ Contract No. E11-286

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: ____

(Signature)

(Printed Name)

(Company Name)

(Street or P.0. Box)

(City, State, Zip Code)

SURETY:

By: ____

(Signature of Attorney-in-Fact)

(Printed Name)

(Company Name)

(Street or P.0. Box)

(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, <u>all</u> Partners must execute bond.

BRH ROOF REPLACEMENT CBJ Contract No. E11-286 Date Issued:

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ARTICLE 1 DEFINITIONS

Wherever used in these General Conditions or in the Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof. Where a word is capitalized in the definitions and is found not capitalized in the Contract Documents it has the ordinary dictionary definition.

Addenda - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

Agreement - The written contract between the OWNER and the CONTRACTOR covering the WORK to be performed; other documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - The form furnished by the ARCHITECT which is to be used by the CONTRACTOR to request progress or final payment and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

ARCHITECT - The ARCHITECT is the firm or person(s) selected by the City and Borough of Juneau (CBJ) to perform the duties of project inspection and management. CBJ will inform the CONTRACTOR of the identity of the ARCHITECT at or before the Notice to Proceed.

Architect of Record – The individual, partnership, corporation, joint-venture or other legal entity legally responsible for preparation of Design and Construction Documents for the project.

Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid - The offer or proposal of the Bidder submitted on the prescribed form setting forth the price or prices for the WORK.

Bonds - Bid, Performance, and Payment Bonds and other instruments which protect against loss due to inability or refusal of the CONTRACTOR to perform its contract.

CBJ - City and Borough of Juneau

CBJ Project Manager - The authorized representative of the City and Borough of Juneau Engineering Department, as OWNER, who is responsible for administration of the contract.

Change Order - A document recommended by the ARCHITECT, which is signed by the CONTRACTOR and the OWNER and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

Contract Documents - The Table of Contents, Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits), Agreement, Performance Bond, Payment Bond, General Conditions, Supplementary General Conditions, Technical Specifications, Drawings, Permits, and all Addenda, Field Orders and Change Orders executed pursuant to the provisions of the Contract Documents.

Contract Price - The total monies payable by the OWNER to the CONTRACTOR under the terms and conditions of the Contract Documents.

Contract Time - The number of successive calendar Days or the specific date stated in the Contract Documents for the completion of the WORK.

CONTRACTOR - The individual, partnership, corporation, joint-venture or other legal entity with whom the OWNER has executed the Agreement.

Day - A calendar day of 24 hours measured from midnight to the next midnight.

Defective WORK - WORK that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or WORK that has been damaged prior to the ARCHITECT's recommendation of final payment.

Drawings - The drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the WORK and which have been prepared by the Architect of Record and are referred to in the Contract Documents. Shop Drawings are not within the meaning of this paragraph.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Field Order - A written order issued by the ARCHITECT which may or may not involve a change in the WORK.

General Requirements - Division 1 of the Technical Specifications.

Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 9603) as amended from time to time.

Holidays - The CBJ legal holidays occur on:

- A. New Year's Day January 1
- B. Martin Luther King's Birthday Third Monday in January
- C. President's Day Third Monday in February
- D. Seward's Day Last Monday in March
- E. Memorial Day Last Monday in May
- F. Independence Day July 4
- G. Labor Day First Monday in September
- H. Alaska Day October 18
- I. Veteran's Day November 11
- J. Thanksgiving Day Fourth Thursday and the following Friday in November
- K. Christmas Day December 25.

If any holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal holidays. If the holiday should fall on a Sunday, Sunday and the following Monday are both legal holidays.

Inspector - The authorized representative of the ARCHITECT assigned to make detailed inspections for conformance to the Contract Documents. Any reference to the Resident Project Representative in this document shall mean the Inspector.

Laws and Regulations; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

Mechanic's Lien - A form of security, an interest in real property, which is held to secure the payment of an obligation. When referred to in these Contract Documents, "Mechanic's Lien" or "lien" means "Stop Notice".

Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date of a portion of the work, or a period of time within which the portion of the work should be performed prior to Substantial Completion of all the WORK.

Notice of Intent to Award - The written notice by the OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the requirements listed therein, within the time specified, the OWNER will enter into an Agreement.

Notice of Award - The written notice by the OWNER to the apparent successful bidder stating that the apparent successful bidder has complied with all conditions for award of the contract.

Notice of Completion - A form signed by the ARCHITECT and the CONTRACTOR recommending to the OWNER that the WORK is Substantially Complete and fixing the date of Substantial Completion. After acceptance of the WORK by the OWNER's governing body, the form is signed by the OWNER. This filing starts the 30 day lien filing period on the WORK.

Notice to Proceed - The written notice issued by the OWNER to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK and establishing the date of commencement of the Contract Time.

OWNER - The City and Borough of Juneau (CBJ), acting through its legally designated officials, officers, or employees.

Partial Utilization - Use by the OWNER of a substantially completed part of the WORK for the purpose for which it is intended prior to Substantial Completion of all the WORK.

PCB's - Polychlorinated biphenyls.

Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

Project - The total construction of which the WORK to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Radioactive Material - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR and submitted by the CONTRACTOR, to the ARCHITECT, to illustrate some portion of the WORK.

Specifications - Same definition as for "Technical Specifications" hereinafter.

Stop Notice - A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work, which secures payment from construction funds possessed by the OWNER. For public property, the Stop Notice remedy is designed to substitute for mechanic's lien rights.

Sub-Consultant - The individual, partnership, corporation, joint-venture or other legal entity having a direct contract with Architect of Record, or with any of its Consultants to furnish services with respect to the Project.

Subcontractor - An individual, partnership, corporation, joint-venture or other legal entity having a direct contract with the CONTRACTOR, or with any of its Subcontractors, for the performance of a part of the WORK at the site.

Substantial Completion - Refers to when the WORK has progressed to the point where, in the opinion of the ARCHITECT as evidenced by Notice of Completion as applicable, it is sufficiently complete, in accordance with the Contract Documents, so that the WORK can be utilized for the purposes for which it is intended; or if no such notice is issued, when final payment is due in accordance with Paragraph 14.8. The terms "substantially complete" and "substantially completed" as applied to any WORK refer to Substantial Completion thereof.

Supplementary General Conditions - The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, material man, or vendor.

Technical Specifications - Divisions 1 through 16 of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the WORK.

Underground Utilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.

WORK, Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. WORK is the result of performing, or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

ARTICLE 2 PRELIMINARY MATTERS

- 2.1 DELIVERY OF BONDS/INSURANCE CERTIFICATES. When the CONTRACTOR delivers the signed Agreements to the OWNER, the CONTRACTOR shall also deliver to the OWNER such Bonds and Insurance Policies and Certificates as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.
- 2.2 COPIES OF DOCUMENTS. The OWNER shall furnish to the CONTRACTOR the required number of copies of the Contract Documents specified in the Supplementary General Conditions.
- 2.3 COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED. The Contract Time will start to run on the commencement date stated in the Notice to Proceed. If no date is stated, Contract Time shall commence upon the date of the Notice to Proceed is issued.
- 2.4 STARTING THE WORK
 - A. The CONTRACTOR shall begin to perform the WORK within 10 days after the commencement date stated in the Notice to Proceed, but no WORK shall be done at the site prior to said commencement date.
 - B. Before undertaking each part of the WORK, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. The CONTRACTOR shall promptly report in writing to the ARCHITECT any conflict, error, or discrepancy which the CONTRACTOR may discover and shall obtain a written interpretation or clarification from the ARCHITECT before proceeding with any WORK affected thereby.
 - C. The CONTRACTOR shall submit to the ARCHITECT for review those documents called for under Section 01300 CONTRACTOR Submittals in the General Requirements.
- 2.5 PRE-CONSTRUCTION CONFERENCE. The CONTRACTOR is required to attend a Pre-Construction Conference. This conference will be attended by the ARCHITECT and others as appropriate in order to discuss the WORK in accordance with the applicable procedures specified in the General Requirements, Section 01010 - Summary of Work.
- 2.6 FINALIZING CONTRACTOR SUBMITTALS. At least 7 days before submittal of the first Application for Payment a conference attended by the CONTRACTOR, the ARCHITECT and others as appropriate will be held to finalize the initial CONTRACTOR submittals in accordance with the General Requirements. As a minimum the CONTRACTOR's representatives should include it's project manager and schedule expert. The CONTRACTOR should plan on this meeting taking no less than 8 hours. If the submittals are not finalized at the end of the meeting, additional meetings will be held so that the submittals can be finalized prior to the submittal of the first Application for Payment. No Application for Payment will be processed until CONTRACTOR submittals are finalized.

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 INTENT

- A. The Contract Documents comprise the entire agreement between the OWNER and the CONTRACTOR concerning the WORK. The Contract Documents shall be construed as a whole in accordance with Alaska Law.
- It is the intent of the Contract Documents to describe the WORK, functionally complete, to be B constructed in accordance with the Contract Documents. Any WORK, materials, or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe WORK, materials, or equipment such words or phrases shall be interpreted in accordance with that meaning, unless a definition has been provided in Article 1 of the General Conditions. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the ARCHITECT, OWNER, the CONTRACTOR, or the Architect of Record or any of their consultants, agents, or employees from those set forth in the Contract Documents.
- C. If, during the performance of the WORK, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the WORK or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, the CONTRACTOR shall report it to the ARCHITECT in writing at once, and the CONTRACTOR shall not proceed with the WORK affected thereby (except in an emergency as authorized by the ARCHITECT) until a clarification Field Order, or Change Order to the Contract Documents has been issued.

3.2 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

- A. In resolving conflicts resulting from, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:
 - 1. Permits from other agencies as may be required by law, excepting the definition of "Permittee" in these permits.
 - 2. Field Orders
 - 3. Change Orders
 - 4. ARCHITECT's written interpretations and clarifications.
 - 5. Agreement
 - 6. Addenda
 - 7. CONTRACTOR's Bid (Bid Form)
 - 8. Supplementary General Conditions
 - 9. Notice Inviting Bids
 - 10. Instructions to Bidders

- 11. General Conditions
- 12. Technical Specifications
- 13 Drawings
- B. With reference to the Drawings the order of precedence is as follows:
 - 1. Figures govern over scaled dimensions
 - 2. Detail drawings govern over general drawings
 - 3. Addenda/Change Order drawings govern over contract Drawings
 - 4. Contract Drawings govern over standard details
- 3.3 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS. The Contract Documents may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof by a Change Order (pursuant to Article 10 CHANGES IN THE WORK).
- 3.4 REUSE OF DOCUMENTS. Neither the CONTRACTOR, nor any Subcontractor or Supplier, nor any other person or organization performing any of the WORK under a contract with the OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other documents used on the WORK, and they shall not reuse any of them on the extensions of the Project or any other project without written consent of the OWNER.

ARTICLE 4 AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 AVAILABILITY OF LANDS. The OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the WORK is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the OWNER, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment; provided, that the CONTRACTOR shall not enter upon nor use any property not under the control of the OWNER until a written temporary construction easement, lease or other appropriate agreement furnished to the ARCHITECT prior to said use; and, neither the OWNER nor the ARCHITECT shall be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any such properties.

4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES

A. Explorations and Reports. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those reports of explorations and tests of sub-surface conditions at the site that have been utilized by the Architect of Record in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, however, reports are not to be considered complete or comprehensive and nontechnical data, interpretations, and opinions contained in such reports are not to be relied on by the CONTRACTOR. The CONTRACTOR is responsible for any further explorations or tests that

may be necessary and any interpretation, interpolation, or extrapolation that it makes of any information shown in such reports.

B. Existing Structures. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Utilities referred to in Paragraph 4.4 herein) which are at or contiguous to the site that have been utilized by the Architect of Record in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, however, nontechnical data, interpretations, and opinions contained in such drawings are not to be relied on by the CONTRACTOR. The CONTRACTOR is also responsible for any interpretation, interpolation, or extrapolation that it makes of any information shown in such drawings.

4.3 DIFFERING SITE CONDITIONS

- A. The CONTRACTOR shall promptly upon discovery (but in no event later than 14 days thereafter) and before the following conditions are disturbed, notify the ARCHITECT, in writing of any:
 - 1. Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Article 1 of these General Conditions, or asbestos, PCB's, petroleum or any other substance or material posing a threat to human or to the environment.
 - 2. Subsurface or latent physical conditions at the site differing from those indicated.
 - 3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the contract.
- B. The ARCHITECT shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR's cost of, or the time required for, performance of any part of the WORK shall issue a Change Order under the procedures described in the contract.
- C. In the event that a dispute arises between the ARCHITECT and the CONTRACTOR whether the conditions materially differ, or involved hazardous waste or other materials listed above, or cause a decrease or increase in the CONTRACTOR's cost of, or time required for, performance of any part of the WORK, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all WORK to be performed under the contract. The CONTRACTOR shall retain any and all rights provided either by contract or by Law which pertain to the resolution of disputes and protests between the contracting parties.

4.4 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES

A. Indicated. The information and data indicated in the Contract Documents with respect to existing Underground Utilities at or contiguous to the site are based on information and data furnished to the OWNER or the Architect of Record by the owners of such Underground Utilities or by others. Unless it is expressly provided in the Supplementary General Conditions and/or Section 01530 - Protection and Restoration of Existing Facilities, the OWNER and the Architect of Record shall not be responsible for the accuracy or completeness of any such information or data, and the CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Utilities indicated in the Contract Documents, for coordination of

the WORK with the owners of such Underground Utilities during construction, for the safety and protection thereof and repairing any damage thereto resulting from the WORK, the cost of which will be considered as having been included in the Contract Price.

B. Not Indicated. If an Underground Utility is uncovered or revealed at or contiguous to the site which was not indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall identify the owner of such Underground Utility and give written notice thereof to that owner and shall notify the ARCHITECT in accordance with the requirements of the Supplementary General Conditions and Section 01530 - Protection and Restoration of Existing Facilities of the General Requirements.

4.5 REFERENCE POINTS

- A. The ARCHITECT will provide one bench mark, near or on the site of the WORK, and will provide two points near or on the site to establish a base line for use by the CONTRACTOR for alignment control. Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish all other lines, grades, and bench marks required for proper execution of the WORK.
- B. The CONTRACTOR shall preserve all bench marks, stakes, and other survey marks, and in case of their removal or destruction by its own employees or by its subcontractor's employees, the CONTRACTOR shall be responsible for the accurate replacement of such reference points by personnel qualified under the Alaska Statute governing the licensing of architects, engineers, and land surveyors.

4.6 USE OF THE CBJ/STATE LEMON CREEK GRAVEL PIT

- A. On City and Borough of Juneau (CBJ) construction projects, the CBJ may make unclassified material available to CONTRACTORs, from the CBJ/State Lemon Creek gravel pit, at a rate less than charged other customers. CONTRACTORs are not required to use material from the CBJ/State pit and the CBJ makes no guarantee as to the quantity or quality of the available material. For this Project, the price shall be \$1.90 per ton.
- B. CONTRACTORs proposing to use gravel from the CBJ/State pit are required to be in good standing for all amounts owed to the CBJ, for previous gravel operations, prior to submitting a mining plan for approval. CONTRACTORs using the pit must comply with Allowable Use Permit USE 98-00047. Failure to meet these requirements, if so subject, shall be sufficient reason to deny use of the CBJ/State pit as a gravel source. To determine if your company is subject to these requirements, contact the CBJ Engineering Department, Gravel Pit Management, at (907) 586-0883.
- C. CONTRACTORs deciding to use material from the CBJ/State pit shall provide an Individual Mining Plan prepared by a professional engineer registered in the State of Alaska. The Individual Mining Plan must be reviewed and approved by the CBJ, prior to commencing operations within the pit. CONTRACTORs shall also secure a Performance Bond to ensure compliance with contract provisions, including any Individual Mining Plan stipulations. The bond shall remain in full force and effect until a release is obtained from the CBJ.
- D. If CONTRACTOR operations for a Project do not exceed 500 tons of material, the CONTRACTOR will not be required to provide an Individual Mining Plan prepared by an engineer, however, the CONTRACTOR must submit an Individual Mining Plan that is in compliance with Allowable Use

Permit USE 98-00047 for gravel extraction within the CBJ/State pit. The CONTRACTOR must contact the CBJ Engineering Department for conditions for the extraction.

- E. CONTRACTORs using the CBJ material may do primary dry separation (screening) of materials within the pit. Crushing and washing of material will not be allowed. CONTRACTORs shall account for placement of materials removed from the pit. The CBJ may require CONTRACTORs to cross-check weight tickets, submit to an audit, or participate in other measures required by the CBJ to ensure accountability. Unprocessed overburden removed from the pit will not be weighed. All other material mined will be weighed at the CBJ scale. CONTRACTORs will be responsible for loading and/or screening their own material. If asphalt pavement is removed as part of the WORK, CONTRACTORs shall dispose of the material at a to-be-specified location within the pit area, as directed by the CBJ Gravel Pit Manager, (907) 586-0883.
- F. The gravel pit overhead charge shall be paid to the CBJ by the CONTRACTOR within 60 days after removal of all materials from the pit and prior to requesting and/or receiving final payment. Upon completion of each excavation CONTRACTORs shall notify the CBJ, in writing, in sufficient time to perform a field-compliance examination prior to vacating the pit. Any significant deviation from the stipulations of the Individual Mining Plan identified during the field inspection shall be corrected by the CONTRACTOR prior to release of the bond. A signed release from CBJ will be required prior to releasing the CONTRACTOR's bond.
- G. If asphalt pavement is removed as part of this WORK, the CONTRACTOR shall dispose of the material at the location designated as the Asphalt Storage Facility, or as directed by the ARCHITECT.
- H. The CBJ/State Pit is a seasonal operation. The hours of operation are from 7:00 a.m. to 6:00 p.m., Monday through Friday, from April 1 through October 15 of the year. CONTRACTORs may obtain gravel on weekends, or during the off-season, by applying for a separate agreement with the City and Borough of Juneau Engineering Department. The CONTRACTOR will be responsible for any additional costs incurred during weekend or off-season operations at the gravel pit.
- I. All CONTRACTORs/equipment operators using the CBJ/State Pit shall be in compliance with Federal Mine Safety and Health Administration regulations for quarry and gravel operations.

ARTICLE 5 BONDS AND INSURANCE

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS

A. The CONTRACTOR shall furnish Performance and Payment Bonds, each in the amount set forth in the Supplementary General Conditions as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. These bonds shall remain in effect at least until one year after the date of Substantial Completion except as otherwise provided by Law or Regulation or by the Contract Documents. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations,

U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

- B. If the surety on any Bond furnished by the CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and Surety, which must be acceptable to the OWNER.
- C. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State of Alaska to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

5.2 INSURANCE

- A. The CONTRACTOR shall purchase and maintain the insurance required under this paragraph. Such insurance shall include the specific coverages set out herein and be written for not less than the limits of liability and coverages provided in the Supplementary General Conditions, or required by law, whichever are greater. All insurance shall be maintained continuously during the life of the Agreement up to the date of Final Completion and at all times thereafter when the CONTRACTOR may be correcting, removing, or replacing Defective WORK in accordance with Paragraph 13.6, but the CONTRACTOR's liabilities under this Agreement shall not be deemed limited in any way to the insurance coverage required.
- B. All insurance required by the Contract Documents to be purchased and maintained by the CONTRACTOR shall be obtained from insurance companies that are duly licensed or authorized in the State of Alaska to issue insurance policies for the limits and coverages so required. Such insurance companies shall have a current Best's Rating of at least an "A" (Excellent) general policy holder's rating and a Class VII financial size category and shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.
- C. The CONTRACTOR shall furnish the OWNER with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be cancelled, reduced in coverage, or renewal refused until at least 30 days' prior written notice has been given to the OWNER by certified mail. All such insurance required herein (except for Workers' Compensation and Employer's Liability) shall name the OWNER, its Consultants and subconsultants and their officers, directors, agents, and employees as "additional insureds" under the policies. The CONTRACTOR shall purchase and maintain the following insurance:
 - 1. Workers' Compensation and Employer's Liability. This insurance shall protect the CONTRACTOR against all claims under applicable state workers' compensation laws. The CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a Workers' Compensation law. This policy shall include an "all states" endorsement. The CONTRACTOR shall require each Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the CONTRACTOR's Workers' Compensation Insurance. In case any

class of employees is not protected, under the Workers' Compensation Statute, the CONTRACTOR shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected.

- 2. Commercial General Liability. This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims arising from injuries to persons other than its employees or damage to property of the OWNER or others arising out of any act or omission of the CONTRACTOR or its agents, employees, or Subcontractors. The policy shall contain no exclusions for any operations within the scope of this contract.
- 3. Comprehensive Automobile Liability. This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, and shall cover operation on or off the site of all motor vehicles licensed for highway use, whether they are owned, non-owned, or hired. Coverage for hired motor vehicles should include endorsement covering liability assumed under this contract.
- 4. Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance. The CONTRACTOR shall either require each of its Subcontractors to procure and to maintain Subcontractor's Commercial General Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplementary General Conditions or insure the activities of its subcontractors in the CONTRACTOR's own policy, in like amount.
- 5. Builder's Risk. This insurance shall be of the "all risks" type, shall be written in completed value form, and shall protect the CONTRACTOR, the OWNER, and the ARCHITECT, against risks of damage to buildings, structures, and materials and equipment. The amount of such insurance shall be not less than the insurable value of the WORK at completion. Builder's risk insurance shall provide for losses to be payable to the CONTRACTOR and the OWNER, as their interests may appear. The policy shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the CONTRACTOR, the OWNER, and the ARCHITECT. The Builder's Risk policy shall insure against all risks of direct physical loss or damage to property from any external cause including flood and earthquake. Allowable exclusions, if any, shall be as specified in the Supplementary General Conditions.

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES

6.1 SUPERVISION AND SUPERINTENDENCE

- A. The CONTRACTOR shall supervise, inspect, and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the completed WORK complies accurately with the Contract Documents.
- B. The CONTRACTOR shall designate in writing and keep on the work site at all times during its progress a technically qualified, English-speaking superintendent, who is an employee of the CONTRACTOR and who shall not be replaced without written notice to the OWNER and the

ARCHITECT. The superintendent will be the CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall issue all its communications to the OWNER through the ARCHITECT and the ARCHITECT only.

C. The CONTRACTOR's superintendent shall be present at the site of the WORK at all times while WORK is in progress. Failure to observe this requirement shall be considered suspension of the WORK by the CONTRACTOR until such time as such superintendent is again present at the site.

6.2 LABOR, MATERIALS, AND EQUIPMENT

- A. The CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and any temporary works as may be required. The CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the WORK or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all WORK at the site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime WORK or the performance of WORK on Saturday, Sunday, or any legal holiday without the OWNER's written consent. The CONTRACTOR shall apply for this consent through the ARCHITECT.
- B. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime WORK, i.e., work in excess of 8 hours in any one calendar day or 40 hours in any one calendar week, even though such overtime WORK may be required under emergency conditions and may be ordered by the ARCHITECT in writing. Additional compensation will be paid the CONTRACTOR for overtime WORK only in the event extra WORK is ordered by the ARCHITECT and the Change Order specifically authorizes the use of overtime WORK and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime WORK of a similar nature in the same locality.
- C. All costs of inspection and testing performed during overtime WORK by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The ARCHITECT shall have the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR.
- D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the WORK.
- E. All materials and equipment to be incorporated into the WORK shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the OWNER. If required by the ARCHITECT, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provisions of any such instructions will be effective to assign to the ARCHITECT, or any of the

Architect's of Record consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraphs 9.9C and 9.9D.

- F. The CONTRACTOR shall at all times employ sufficient labor and equipment for prosecuting the several classes of WORK to full completion in the manner and time set forth in and required by these specifications. All workers shall have sufficient skill and experience to properly perform the WORK assigned to them. Workers engaged in special WORK, or skilled WORK, shall have sufficient experience in such WORK and in the operation of the equipment required to perform all WORK, properly and satisfactorily.
- G. Any person employed by the CONTRACTOR or by any SUBCONTRACTOR who, in the opinion of the ARCHITECT, does not perform the WORK in a proper and skillful manner, or is intemperate or disorderly shall, at the written request of the ARCHITECT, be removed forthwith by the CONTRACTOR or Subcontractor employing such person, and shall not be employed again in any portion of the WORK without the approval of the ARCHITECT. Should the CONTRACTOR fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the WORK, the ARCHITECT may suspend the WORK by written notice until such orders are complied with.
- 6.3 ADJUSTING PROGRESS SCHEDULE. The CONTRACTOR shall submit monthly updates of the progress schedule to the ARCHITECT for acceptance in accordance with the provisions in Section 01300 CONTRACTOR Submittals in the General Requirements.
- 6.4 SUBSTITUTES OR "OR-EQUAL" ITEMS. The CONTRACTOR shall submit proposed substitutes or "or-equal" items in accordance with the provisions in Section 01300 CONTRACTOR Submittals in the General Requirements.
- 6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS. The CONTRACTOR shall be responsible to the OWNER and the ARCHITECT of Record for the acts and omissions of its subcontractors and their employees to the same extent as CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this Paragraph shall create any contractual relationship between any subcontractor and the OWNER or the ARCHTIECT nor relieve the CONTRACTOR of any liability or obligation under the contract.

6.6 PERMITS

- A. Unless otherwise provided in the Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including the furnishing of insurance and Bonds if required by such agencies. The enforcement of such requirements under this contract shall not be made the basis for claims for additional compensation. The OWNER shall assist the CONTRACTOR, when necessary, in obtaining such permits and licenses. The CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the WORK, which are applicable at the time of opening of Bids. The CONTRACTOR shall pay all charges of utility owners for connections to the WORK.
- B. These Contract Documents may require that the WORK be performed within the conditions and/or requirements of local, state and/or federal permits. These permits may be bound within the Contract Documents, included within the Contract Documents by reference, or included as part of the WORK, as designated in this Section. The CONTRACTOR is responsible for completing the WORK required

for compliance with all permit requirements; this WORK is incidental to other items in the Contract Documents. Any reference to the PERMITTEE in the permits shall mean the CONTRACTOR. If any permits were acquired by the OWNER, this action was done to expedite the start of construction. If the CONTRACTOR does not complete the WORK within the specified permit window, the CONTRACTOR shall be responsible for the permit extension, and for completing any additional requirements placed upon the permit.

- 6.7 PATENT FEES AND ROYALTIES. The CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product, software or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of the OWNER or the Architect of Record its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the OWNER in the Contract Documents. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER and the Architect of Record and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses (including attorneys' fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product, or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.
- 6.8 LAWS AND REGULATIONS. The CONTRACTOR shall observe and comply with all federal, state, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK. If any discrepancy or inconsistency should be discovered in this contract in relation to any such law, ordinance, code, order, or regulation, the CONTRACTOR shall report the same in writing to the ARCHITECT. The CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the Architect of Record, and their officers, agents, and employees against all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees, Subcontractors, or third parties. Any particular law or regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations.
- 6.9 TAXES. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the WORK.
- 6.10 USE OF PREMISES. The CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to (1) the Project site, (2) the land and areas identified in and permitted by the Contract Documents, and (3) the other land and areas permitted by Laws and Regulations, rights-of-way, permits, leases and easements. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the OWNER or the Architect of Record by any such owner or occupant because of the performance of the WORK, the CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim through litigation. The CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify, defend, and hold the OWNER and the Architect of Record harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of Architect's of Records attorneys, and other

professionals and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any such owner or occupant against the OWNER, the Architect of Record, their consultants, sub-consultants, and the officers, directors, employees and agents of each and any of them to the extent caused by or based upon the CONTRACTOR's performance of the WORK.

6.11 SAFETY AND PROTECTION

- A. The CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all employees on the WORK and other persons and organizations who may be affected thereby;
 - 2. all the WORK and materials and equipment to be incorporated therein, whether in storage on or off the site; and
 - 3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
- B. The CONTRACTOR shall comply with all applicable Laws and Regulations whether referred to herein or not) of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. The CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and program.
- D. Materials that contain hazardous substances or mixtures may be required on the WORK. A Material Safety Data Sheet (MSDS) shall be requested by the CONTRACTOR from the manufacturer of any hazardous product used.
- E. Material usage shall be accomplished with strict adherence to all safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.
- F. The CONTRACTOR shall be responsible for coordinating communications on any exchange of Material Safety Data Sheets or other hazardous material information that is required to be made available to, or exchanged between, or among, employers at the site in accordance with Laws or Regulations.
- G. The CONTRACTOR shall notify the ARCHITECT if it considers a specified product or its intended usage to be unsafe. This notification must be given to the ARCHITECT prior to the product being ordered, or if provided by some other party, prior to the product being incorporated in the WORK.

6.12 SHOP DRAWINGS AND SAMPLES

- A. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the ARCHITECT for review, all Shop Drawings in accordance with Section 01300 CONTRACTOR Submittals in the General Requirements.
- B. The CONTRACTOR shall also submit to the ARCHITECT for review all samples in accordance with Section 01300 CONTRACTOR Submittals in the General Requirements.
- C. Before submittal of each Shop Drawing or sample, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the WORK and the Contract Documents.
- 6.13 CONTINUING THE WORK. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the OWNER. No WORK shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the OWNER may otherwise agree in writing.

6.14 INDEMNIFICATION

- A. To the fullest extent permitted by Laws and Regulations, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the Architect of Record, their consultants, sub-consultants and the officers, directors, employees, and agents of each and any of them, against and from all claims and liability arising under, by reason of or incidentally to the contract or any performance of the WORK, but not from the sole negligence or willful misconduct of the OWNER, and the Architect of Record. Such indemnification by the CONTRACTOR shall include but not be limited to the following:
 - 1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its employees, or agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, agents, or third parties;
 - 2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR's or Subcontractor's own employees engaged in the WORK resulting in actions brought by or on behalf of such employees against the OWNER, or the Architect of Record;
 - 3. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the CONTRACTOR, its employees, or agents;
 - 4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its employees, or agents in the performance of this contract of any copyrighted or non-copyrighted composition, secret process, patented or non-patented invention, computer software, article, or appliance, unless otherwise specifically stipulated in this contract.

- 5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the ARCHITECT, OWNER or any other parties by the CONTRACTOR, its employees, or agents;
- 6. Liabilities or claims arising directly or indirectly from the willful or criminal misconduct of the CONTRACTOR, its employees, or agents; and,
- 7. Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the CONTRACTOR.
- B. The CONTRACTOR shall reimburse the OWNER and the Architect of Record for all costs and expenses, (including but not limited to fees and charges of Architects of Record, attorneys, and other professionals and court costs including all costs of appeals) incurred by the OWNER, and the Architect of Record in enforcing the provisions of this Paragraph 6.14.
- C. The indemnification obligation under this Paragraph 6.14 shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any such Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- 6.15 CONTRACTOR'S DAILY REPORTS. The CONTRACTOR shall complete a daily report indicating total manpower for each construction trade, major equipment on site, each Subcontractor's manpower, weather conditions, etc., involved in the performance of the WORK. The daily report shall be completed on forms provided by the ARCHITECT and shall be submitted to the ARCHITECT at the conclusion of each WORK day. The report should comment on the daily progress and status of the WORK within each major component of the WORK. These components will be decided by the ARCHITECT. The CONTRACTOR shall record the name, affiliation, time of arrival and departure, and reason for visit for all visitors to the location of the WORK.
- 6.16 ASSIGNMENT OF CONTRACT. The CONTRACTOR shall not assign, sublet, sell, transfer, or otherwise dispose of the contract or any portion thereof, or its right, title, or interest therein, or obligations thereunder, without the written consent of the OWNER except as imposed by law. If the CONTRACTOR violates this provision, the contract may be terminated at the option of the OWNER. In such event, the OWNER shall be relieved of all liability and obligations to the CONTRACTOR and to its assignee or transferee, growing out of such termination.
- 6.17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES. It is understood that any turn-on, or turn-off line locates and any other WORK or assistance necessary by the CBJ Water Utilities Division, will be at the CONTRACTOR's expense unless otherwise stated in the bid documents. All cost must be agreed to prior to any related actions, and will be considered incidental to the Project cost. Billing to the CONTRACTOR will be direct from the CBJ Water Utilities Division.

6.18 OPERATING WATER SYSTEM VALVES

A. The CONTRACTOR shall submit a written request, to the ARCHITECT, for approval to operate any valve on any in-service section of the CBJ water system. The request must be submitted at least 24-hours prior to operating any valves. The CBJ Water Utilities Division reserves the right to approve or deny the request. The request shall specifically identify each valve to be operated, the time of operation, and the operation to be performed. The CONTRACTOR shall obtain the written approval of the ARCHITECT for any scheduled operation before operating any valve.

- B. The CONTRACTOR shall be responsible for all damages, both direct and consequential, to the OWNER or any other party, caused by unauthorized operation of any valve of the CBJ water system.
- 6.19 CONTRACTOR'S WORK SCHEDULE LIMITATIONS. Construction of Buildings and Projects. It is unlawful to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or similar heavy construction equipment before 7:00 a.m. or after 10:00 p.m., Monday through Friday, or before 9:00 a.m. or after 10:00 p.m., Saturday and Sunday, unless a permit shall first be obtained from the City and Borough Building Official. Such permit shall be issued by the Building Official only upon a determination that such operation during hours not otherwise permitted hereunder is necessary and will not result in unreasonable disturbance to surrounding residents.

ARTICLE 7 OTHER WORK

7.1 RELATED WORK AT SITE

- A. The OWNER may perform other work related to the Project at the site by the OWNER's own forces, have other work performed by utility owners, or let other direct contracts therefor which may contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work.
- B. The CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (or the OWNER, if the OWNER is performing the additional work with the OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate with their WORK. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to make its several parts come together properly and integrate with such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the ARCHITECT and the others whose work will be affected.
- C. If the proper execution or results of any part of the CONTRACTOR's WORK depends upon the work of any such other contractor or utility owner (or OWNER), the CONTRACTOR shall inspect and report to the ARCHITECT in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to report such delays, defects, or deficiencies will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's WORK except for latent or nonapparent defects and deficiencies in the other work.
- 7.2 COORDINATION. If the OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary General Conditions, and the specific matters to be covered by such authority and responsibility will be itemized and the extent of such authority and responsibilities will be provided in the Supplementary General Conditions.

ARTICLE 8 OWNER'S RESPONSIBILITIES

8.1 COMMUNICATIONS

- A. The OWNER shall issue all its communications to the CONTRACTOR through the ARCHITECT.
- B. The CONTRACTOR shall issue all its communications to the OWNER through the ARCHITECT.
- 8.2 PAYMENTS. The OWNER shall make payments to the CONTRACTOR as provided in Paragraphs 14.5, 14.8, 14.9 and 14.10.
- 8.3 LANDS, EASEMENTS, AND SURVEYS. The OWNER's duties in respect of providing lands and easements and providing surveys to establish reference points are set forth in Paragraphs 4.1 and 4.5.
- 8.4 CHANGE ORDERS. The OWNER shall execute Change Orders as indicated in Paragraph 10.1F.
- 8.5 INSPECTIONS AND TESTS. The OWNER's responsibility in respect of inspections, tests, and approvals is set forth in Paragraph 13.3.
- 8.6 SUSPENSION OF WORK. In connection with the OWNER's right to stop WORK or suspend WORK, see Paragraphs 13.4 and 15.1.
- 8.7 TERMINATION OF AGREEMENT. Paragraphs 15.2 and 15.3 deal with the OWNER's right to terminate services of the CONTRACTOR.

ARTICLE 9 ARCHITECT'S STATUS DURING CONSTRUCTION

- 9.1 OWNER'S REPRESENTATIVE. The ARCHITECT will be the OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of the ARCHITECT as the OWNER's representative during construction are set forth in the Contract Documents.
- 9.2 VISITS TO SITE. The ARCHITECT will make visits to the site during construction to observe the progress and quality of the WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. Exhaustive or continuous on-site inspections to check the quality or quantity of the WORK will not be required of the ARCHITECT. The ARCHITECT will not, during such visits, or as a result of such observations of the CONTRACTOR's WORK in progress, supervise, direct, or have control over the CONTRACTOR's WORK.
- 9.3 PROJECT REPRESENTATION. The ARCHITECT may furnish an Inspector to assist in observing the performance of the WORK. The duties, responsibilities, and limitations of authority of any such Inspector and assistants will be as provided in the Supplementary General Conditions.
- 9.4 CLARIFICATIONS AND INTERPRETATIONS. The ARCHITECT will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the ARCHITECT may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

- 9.5 AUTHORIZED VARIATIONS IN WORK. The ARCHITECT may authorize variations in the WORK from the requirements of the Contract Documents. These may be accomplished by a Field Order and will require the CONTRACTOR to perform the WORK involved in a manner that minimizes the impact to the WORK and the contract completion date. If the CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time, the CONTRACTOR may make a claim therefor as provided in Article 11 or 12.
- 9.6 REJECTING OR ACCEPTING DEFECTIVE WORK. The ARCHITECT will have authority to reject or accept WORK which the ARCHITECT believes to be defective and will also have authority to require special inspection or testing of the WORK as provided in Paragraph 13.3G, whether or not the WORK is fabricated, installed, or completed.

9.7 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS

- A. In accordance with the procedures set forth in the General Requirements, the ARCHITECT will review all CONTRACTOR submittals, including Shop Drawings, samples, substitutes, or "or equal" items, etc., in order to determine if the items covered by the submittals will, after installation or incorporation in the WORK, conform to the requirements of the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. The ARCHITECT's review will not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto.
- B. In connection with the ARCHITECT's responsibilities as to Change Orders, see Articles 10, 11, and 12.
- C. In connection with the ARCHITECT's responsibilities in respect of Applications for Payment, see Article 14.

9.8 DECISIONS ON DISPUTES

- A. The ARCHITECT will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the WORK thereunder. Claims, disputes, and other matters relating to the acceptability of the WORK; the interpretation of the requirements of the Contract Documents pertaining to the performance of the WORK; and those claims under Articles 11 and 12 in respect to changes in the Contract Price or Contract Time will be referred initially to the ARCHITECT in writing with a request for formal decision in accordance with this paragraph, which the ARCHITECT will render in writing within 30 days of receipt of the request. Written notice of each such claim, dispute, and other matter will be delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the occurrence of the event giving rise thereto. Written supporting data will be submitted to the ARCHITECT within 60 days after such occurrence unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim.
- B. The rendering of a decision by the ARCHITECT with respect to any such claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 14.12) will be a condition precedent to any exercise by the OWNER or the CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Law or Regulations in respect of any such claim, dispute, or other matter.

9.9 LIMITATION ON ARCHITECT'S RESPONSIBILITIES

- A. Neither the ARCHITECT's authority to act under this Article or other provisions of the Contract Documents nor any decision made by the ARCHITECT in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ARCHITECT to the CONTRACTOR, any Subcontractor, any Supplier, any surety for any of them, or any other person or organization performing any of the WORK.
- B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the ARCHITECT as to the WORK, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the requirements of the Contract Documents, and conformance with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ARCHITECT any duty or authority to supervise or direct the performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9C or 9.9D.
- C. The ARCHITECT will not supervise, direct, control, or have authority over or be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the CONTRACTOR to comply with Laws and Regulations, applicable to the performance of the WORK. The ARCHITECT will not be responsible for the CONTRACTOR's failure to perform the WORK in accordance with the Contract Documents.
- D. The ARCHITECT will not be responsible for the acts or omissions of the CONTRACTOR nor of any Subcontractor, Supplier, or any other person or organization performing any of the WORK.

ARTICLE 10 CHANGES IN THE WORK

10.1 GENERAL

- A. Without invalidating the Agreement and without notice to any surety, the OWNER may at any time or from time to time, order additions, deletions, or revisions in the WORK; these will be authorized by a written Field Order and/or a Change Order issued by the ARCHITECT.
- B. If the CONTRACTOR believes that it is entitled to an increase or decrease in the Contract Price, or an extension or shortening in the Contract Time as the result of a Field Order, a claim may be made as provided in Articles 11 and 12.
- C. If the OWNER and CONTRACTOR agree on the value of any WORK, or the amount of Contract Time that should be allowed as a result of a Field Order, upon receiving written notice from the ARCHITECT, the CONTRACTOR shall proceed so as to minimize the impact on and delays to the WORK pending the issuance of a Change Order.
- D. If the OWNER and the CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be

allowed as a result of a Field Order, the ARCHITECT can direct the CONTRACTOR to proceed on the basis of Time and Materials so as to minimize the impact on and delays to the WORK, and a claim may be made therefor as provided in Articles 11 and 12.

- E. The CONTRACTOR shall not be entitled to an increase in the Contract Price nor an extension of the Contract Time with respect to any WORK performed that is not required by the Contract Documents as amended, modified, supplemented by Change Order, except in the case of an emergency and except in the case of uncovering WORK as provided in Paragraph 13.3G.
- F. The OWNER and the CONTRACTOR shall execute appropriate Change Orders covering:
 - 1. changes in the WORK which are ordered by the OWNER pursuant to Paragraph 10.1A;
 - 2. changes required because of acceptance of Defective WORK under Paragraph 13.7;
 - 3. changes in the Contract Price or Contract Time which are agreed to by the parties; or
 - 4. changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by the ARCHITECT pursuant to Paragraph 9.8.
- G. If notice of any change is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable Bond shall be adjusted accordingly.

10.2 ALLOWABLE QUANTITY VARIATIONS

- A. In the event of an increase or decrease in bid item quantity of a unit price contract, the total amount of WORK actually done or materials or equipment furnished shall be paid for according to the unit price established for such WORK under the Contract Documents, wherever such unit price has been established; provided, that an adjustment in the Contract Price may be made for changes which result in an increase or decrease in excess of 25% of the estimated quantity of any major item of the WORK. Major Item is defined as any bid item amount that is ten percent (10%) or more of the total contract amount.
- B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover such eliminated WORK, the price of the eliminated WORK shall be agreed upon in writing by the OWNER and the CONTRACTOR. If the OWNER and the CONTRACTOR fail to agree upon the price of the eliminated WORK, said price shall be determined in accordance with the provisions of Article 11.

ARTICLE 11 CHANGE OF CONTRACT PRICE

11.1 GENERAL

- A. The Contract Price constitutes the total compensation payable to the CONTRACTOR for performing the WORK. All duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR to complete the WORK shall be at its expense without change in the Contract Price.
- B. The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the start of the occurrence or the event giving rise

to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within 60 days after such occurrence (unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of said occurrence or event. All claims for adjustment in the Contract Price shall be determined by the ARCHITECT in accordance with Paragraph 9.8A if the OWNER and the CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.1B.

- C. The value of any WORK covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
 - 1. Where the WORK involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.
 - 2. By mutual acceptance of a lump sum, which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.4.
 - 3. On the basis of the "Cost of WORK" (determined as provided in Paragraphs 11.3) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.4).
- 11.2 COSTS RELATING TO WEATHER. The CONTRACTOR shall have no claims against the OWNER for damages for any injury to WORK, materials, or equipment, resulting from the action of the elements. If, however, in the opinion of the ARCHITECT, the CONTRACTOR has made all reasonable efforts to protect the materials, equipment and WORK, the CONTRACTOR may be granted a reasonable extension of Contract Time to make proper repairs, renewals, and replacements of the WORK, materials, or equipment.

11.3 COST OF WORK (BASED ON TIME AND MATERIALS)

- A. General. The term "Cost of WORK" means the sum of all costs necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of extra WORK. Except as otherwise may be agreed to in writing by the OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items, and shall not include any of the costs itemized in <u>Paragraph 11.5 EXCLUDED COSTS</u>.
- B. Labor. The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra WORK at the time the extra WORK is done, plus employer payments of payroll taxes, worker's compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers shall be paid only when such costs are not included in the invoice for equipment rental. The labor costs for forepersons shall be proportioned to all of their assigned WORK and only that applicable to extra WORK shall be paid. Non-direct labor costs including superintendence shall be considered part of the mark-up set out in paragraph 11.4.
- C. Materials. The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the job in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:

- 1. Trade discounts available to the purchaser shall be credited to the OWNER notwithstanding the fact that such discounts may not have been taken by the CONTRACTOR.
- 2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ARCHITECT. Mark-up except for actual costs incurred in the handling of such materials will not be allowed.
- 3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra WORK items or the current wholesale price for such materials delivered to the WORK site, whichever price is lower.
- 4. If in the opinion of the ARCHITECT the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the WORK site less trade discount. The OWNER reserves the right to furnish materials for the extra WORK and no claim shall be allowed by the CONTRACTOR for costs and profit on such materials.
- D. Equipment. The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the Supplementary General Conditions. Such rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the OWNER for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the publication specified in the Supplementary General Conditions, an equitable rental rate for the equipment will be established by the ARCHITECT. The CONTRACTOR may furnish cost data which might assist the ARCHITECT in the establishment of the rental rate.
 - 1. All equipment shall, in the opinion of the ARCHITECT, be in good working condition and suitable for the purpose for which the equipment is to be used.
 - 2. Before construction equipment is used on the extra WORK, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ARCHITECT, in duplicate, a description of the equipment and its identifying number.
 - 3. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 - 4. Individual pieces of equipment or tools having a replacement value of \$200 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.
 - 5. Rental time will not be allowed while equipment is inoperative due to breakdowns.
 - 6. <u>Equipment</u>. Unless otherwise agreed to in writing, the CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the current edition of the following reference publication: "Rental Rate Blue Book" available on-line at http://www.equipmentwatch.com/rrbb.htm or contact Equipment Watch at (800) 669-3282.
- E. Equipment on the WORK Site. The rental time to be paid for equipment on the WORK site shall be the time the equipment is in productive operation on the extra WORK being performed and, in addition, shall include the time required to move the equipment to the location of the extra WORK and return it to the original location or to another location requiring no more time than that required

to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra WORK, even though located at the site of the extra WORK. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the site of the extra WORK on other than the extra WORK. The following shall be used in computing the rental time of equipment on the WORK site.

- 1. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
- 2. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation. When owner-operated equipment is used to perform extra WORK to be paid for on a time and materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraphs (3), (4), and (5), following.
- 3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.3D, herein.
- 4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the WORK site, or in the absence of such labor, established by collective bargaining agreements for the type of worker and location of the extra WORK, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Paragraph 11.3B, herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages.
- 5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.4, herein.
- F. Specialty WORK. Specialty WORK is defined as that WORK characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. The following shall apply in making estimates for payment for specialty WORK:
 - 1. Any bid item of WORK to be classified as Specialty WORK shall be listed as such in the Supplementary General Conditions. Specialty WORK shall be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the ARCHITECT, invoices for Specialty WORK based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs.
 - 2. When the CONTRACTOR is required to perform WORK necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, the charges for that portion of the WORK performed at the off-site facility may, by agreement, be accepted as Specialty WORK and accordingly, the invoices for the WORK may be accepted without detailed itemization.
 - 3. All invoices for specialty WORK will be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit specified in Paragraph 11.4, herein, an allowance of 5 percent will be added to invoices for specialty WORK.

G. Sureties. All WORK performed hereunder shall be subject to all of the provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference thereto as under the original Agreement. Copies of all amendments to surety Bonds or supplemental surety Bonds shall be submitted to the OWNER for review prior to the performance of any WORK hereunder.

11.4 CONTRACTOR'S FEE

A. Extra WORK ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ARCHITECT, plus allowances for overhead and profit. The allowance for overhead and profit shall include full compensation for superintendence, Bond and insurance premiums, taxes, field office expense, extended overhead, home office overhead, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraph 11.3. The allowance for overhead and profit will be made in accordance with the following schedule:

Actual Overhead and Profit Allowance

Labor	
Materials	
Equipment	1

To the sum of the costs and mark-ups provided for in this Article, one (1) percent shall be added as compensation for Bonds.

B. It is understood that labor, materials, and equipment may be furnished by the CONTRACTOR or by the Subcontractor on behalf of the CONTRACTOR. When all or any part of the extra WORK is performed by a Subcontractor, the allowance specified herein shall be applied to the labor, materials, and equipment costs of the Subcontractor, to which the CONTRACTOR may add five (5) percent of the Subcontractor's total cost for the extra WORK. Regardless of the number of hierarchical tiers of Subcontractors, the five (5) percent increase above the Subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only.

11.5 EXCLUDED COSTS.

- A. The term "Cost of the WORK" shall not include any of the following:
 - 1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, architects, estimators, attorneys' auditors, accountants, purchasing and contracting agents, expenditures, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the WORK, or not specifically covered by paragraph 11.3, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
 - 2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
 - 3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the WORK and charges against CONTRACTOR for delinquent payments.

- 4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by paragraph 11.4 above).
- 5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective WORK, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 6. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in paragraph 11.4.

ARTICLE 12 CHANGE OF CONTRACT TIME

12.1 GENERAL

- A. The Contract Time may only be changed by a Change Order. Any claim for an extension of the Contract Time (or Milestones) shall be based on written notice delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 60 days after such occurrence (unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the ARCHITECT in accordance with Paragraph 9.8 if the OWNER and the CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph. An increase in Contract Time does not mean that the CONTRACTOR is due an increase in Contract Price. Only Compensable time extensions will result in an increase in Contract Price.
- B. All time limits stated in the Contract Documents are of the essence of the Agreement.
- C. Where CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost on the critical path of the Project due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, unprecedented weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.
- D. Where CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost on the critical path of the Project due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall the OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of

CONTRACTOR, or (ii) delays beyond the control of both parties including but not limited to fires, floods, epidemics abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

12.2 EXTENSIONS OF TIME FOR DELAY DUE TO WEATHER. Contract time may be extended by the ARCHITECT because of delays in completion of the WORK due to unusually severe weather, provided that the CONTRACTOR shall, within 10 days of the beginning of any such delay, notify the ARCHITECT in writing of the cause of delay and request an extension of contract time. The ARCHITECT will ascertain the facts and the extent of the delay and extend the time for completing the WORK when, in the ARCHITECT's judgment, the findings of fact justify such an extension. Unprecedented, abnormal, or unusually severe weather will be defined as an event, or events, with a greater than 50-year recurrence interval, as determined by the National Weather Service, or equivalent state or federal agency.

ARTICLE 13 WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

- 13.1 WARRANTY AND GUARANTEE. The CONTRACTOR warrants and guarantees to the OWNER and the ARCHITECT that all WORK will be in accordance with the Contract Documents and will not be defective. Prompt notice of defects known to the OWNER or ARCHITECT shall be given to the CONTRACTOR. All Defective WORK, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13.
- 13.2 ACCESS TO WORK. The OWNER, ARCHITECT, Architect of Record, their consultants, subconsultants, other representatives and personnel of OWNER, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the WORK at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

13.3 INSPECTIONS AND TESTS

- A. The CONTRACTOR shall give the ARCHITECT timely notice of readiness of the WORK for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. If Laws or Regulations of any public body having jurisdiction other than the OWNER require any WORK to specifically be inspected, tested, or approved, the CONTRACTOR shall pay all costs in connection therewith. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the OWNER's or the ARCHITECT's acceptance of a Supplier of materials or equipment proposed as a substitution or (or-equal) to be incorporated in the WORK, or of materials or equipment submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK. The cost of all inspections, tests, and approvals in addition to the above which are required by the Contract Documents shall be paid by the OWNER (unless otherwise specified).
- C. The ARCHITECT will make, or have made, such inspections and tests as the ARCHITECT deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. Unless otherwise specified in the Supplementary General Conditions, the cost

of such inspection and testing will be borne by the OWNER. In the event such inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ARCHITECT, as well as the cost of subsequent re-inspection and retesting. Neither observations by the ARCHITECT nor inspections, tests, or approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

- D. All inspections, tests, or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to the ARCHITECT and the CONTRACTOR.
- E. If any WORK (including the work of others anticipated under paragraph 7.1) that is to be inspected, tested, or approved is covered without written concurrence of the ARCHITECT, it must, if requested by the ARCHITECT, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the ARCHITECT timely notice of the CONTRACTOR's intention to perform such test or to cover the same and the ARCHITECT has not acted with reasonable promptness in response to such notice.
- F. If any WORK is covered contrary to the written request of the ARCHITECT, it must, if requested by the ARCHITECT, be uncovered for the ARCHITECT's observation and recovered at the CONTRACTOR's expense.
- G. If the ARCHITECT considers it necessary or advisable that covered WORK be observed by the ARCHITECT or inspected or tested by others, the CONTRACTOR, at the ARCHITECT's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as the ARCHITECT may require, that portion of the WORK in question, furnishing all necessary labor, material, and equipment. If it is found that such WORK is defective, the CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including but not limited to fees and charges of Architects of Record, attorneys, and other professionals. However, if such WORK is not found to be defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, the CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.
- 13.4 OWNER MAY STOP THE WORK. If the WORK is defective, or the CONTRACTOR fails to perform WORK in such a way that the completed WORK will conform to the Contract Documents, the OWNER may order the CONTRACTOR to stop the WORK, or any portion thereof, until the cause for such order has been eliminated; however, this right of the OWNER to stop the WORK shall not give rise to any duty on the part of the OWNER to exercise this right for the benefit of the CONTRACTOR or any other party.
- 13.5 CORRECTION OR REMOVAL OF DEFECTIVE WORK. If required by the ARCHITECT, the CONTRACTOR shall promptly, either correct all Defective WORK, whether or not fabricated, installed, or completed, or, if the WORK has been rejected by the ARCHITECT, remove it from the site and replace it with non-defective WORK. The CONTRACTOR shall bear all direct, indirect and consequential costs and damages of such correction or removal, including but not limited to fees and charges of Architects of Record, attorneys, and other professionals made necessary thereby.

13.6 ONE YEAR CORRECTION PERIOD

- A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any WORK is found to be defective, the CONTRACTOR shall promptly, without cost to the OWNER and in accordance with OWNER's written notification, (i) correct such Defective WORK, or, if it has been rejected by the OWNER, remove it from the site and replace it with non-defective WORK, and (ii) satisfactorily correct or remove and replace any damage to other work of others resulting therefrom. If the CONTRACTOR does not promptly comply with such notification, or in an emergency where delay would cause serious risk of loss or damage, the OWNER may have the Defective WORK corrected or the rejected WORK removed and replaced, and all direct, indirect, and consequential costs and damages of such removal and replacement including but not limited to fees and charges of Architects of Record, attorneys and other professionals will be paid by the CONTRACTOR.
- B. Where Defective WORK (and damage to other WORK resulting therefrom) has been corrected, removed or replaced under this paragraph 13.6, the correction period hereunder with respect to such WORK will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- 13.7 ACCEPTANCE OF DEFECTIVE WORK. If, instead of requiring correction or removal and replacement of Defective WORK, the OWNER prefers to accept the WORK, the OWNER may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the OWNER's evaluation of and determination to accept such Defective WORK. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the OWNER shall be entitled to an appropriate decrease in the Contract Price.

ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION

- 14.1 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN). The Schedule of Values or lump sum price breakdown established as provided in the General Requirements shall serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the ARCHITECT.
- 14.2 UNIT PRICE BID SCHEDULE. Progress payments on account of Unit Price WORK will be based on the number of units completed.

14.3 APPLICATION FOR PROGRESS PAYMENT

- A. Unless otherwise prescribed by law, on the 25th of each month, the CONTRACTOR shall submit to the ARCHITECT for review, an Application for Payment filled out and signed by the CONTRACTOR covering the WORK completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
- B. The Application for Payment shall identify, as a sub-total, the amount of the CONTRACTOR's Total Earnings to Date, plus the Value of Materials Stored at the Site which have not yet been incorporated in the WORK, and less a deductive adjustment for materials installed which were not previously

incorporated in the WORK, but for which payment was allowed under the provisions for payment for Materials Stored at the Site, but not yet incorporated in the WORK.

- C. The Net Payment Due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the total amount of all previous payments made to the CONTRACTOR. Progress payments will be paid in full in accordance with Article 14 of the General Conditions until 90% of the contract amount has been paid. The remaining 10% of the contract amount shall be retained until:
 - 1. final inspection has been made;
 - 2. completion of the project;
 - 3. acceptance of the project by the OWNER and;
 - 4. the OWNER has received notification from the Alaska Department of Labor that the CONTRACTOR has no outstanding wage/hour violations.
- D. The Value of Materials Stored at the Site shall be an amount equal to the specified percent of the value of such materials as set forth in the Supplementary General Conditions. Said amount shall be based upon the value of all acceptable materials and equipment not incorporated in the WORK but delivered and suitably stored at the Project site or at another location agreed to in writing; provided, each such individual item has a value of more than \$5000 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all liens, charges, security interests, and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the OWNER's interest therein, all of which will be satisfactory to the OWNER.
- 14.4 CONTRACTOR'S WARRANTY OF TITLE. The CONTRACTOR warrants and guarantees that title to all WORK, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the OWNER no later than the time of payment free and clear of all liens.

14.5 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT

- A. The ARCHITECT will, within seven (7) days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the OWNER, or return the Application to the CONTRACTOR indicating in writing the ARCHITECT's reasons for refusing to recommend payment. In the later case, the CONTRACTOR may make the necessary corrections and resubmit the Application. If the ARCHITECT still disagrees with a portion of the Application, it will submit the Application recommending the undisputed portion of the Application to the OWNER for review and provide reasons for recommending non-payment of the disputed amount. Thirty days after presentation of the Application for Payment with the ARCHITECT's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.5B) become due and when due will be paid by the OWNER to the CONTRACTOR.
- B. The OWNER may refuse to make payment of the full amount recommended by the ARCHITECT because claims have been made against the OWNER on account of the CONTRACTOR's performance of the WORK or Liens have been filed in connection with the WORK or there are other items entitling the OWNER to a credit against the amount recommended, but the OWNER must give

the CONTRACTOR written notice within seven (7) days (with a copy to the ARCHITECT) stating the reasons for such action.

14.6 PARTIAL UTILIZATION

- A. The OWNER shall have the right to utilize or place into service any item of equipment or other usable portion of the WORK prior to completion of the WORK. Whenever the OWNER plans to exercise said right, the CONTRACTOR will be notified in writing by the OWNER, identifying the specific portion or portions of the WORK to be so utilized or otherwise placed into service.
- B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of partial utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.
- C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the OWNER and the CONTRACTOR's one year correction period shall commence only after the date of Substantial Completion for the WORK.
- 14.7 SUBSTANTIAL COMPLETION. When the CONTRACTOR considers the WORK ready for its intended use the CONTRACTOR shall notify the OWNER and the ARCHITECT in writing that the WORK is substantially complete. The CONTRACTOR will attach to this request a list of all WORK items that remain to be completed and a request that the ARCHITECT prepare a Notice of Completion. Within a reasonable time thereafter, the OWNER, the CONTRACTOR, and the ARCHITECT shall make an inspection of the WORK to determine the status of completion. If the ARCHITECT does not consider the WORK substantially complete, or the list of remaining WORK items to be comprehensive, the ARCHITECT will notify the CONTRACTOR in writing giving the reasons thereof. If the ARCHITECT considers the WORK substantially complete, the ARCHITECT will prepare and deliver to the OWNER, for its execution and recording, the Notice of Completion.
- 14.8 FINAL APPLICATION FOR PAYMENT. After the CONTRACTOR has completed all of the remaining WORK items referred to in Paragraph 14.7 and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, record as-built documents (as provided in the General Requirements) and other documents, all as required by the Contract Documents, and after the ARCHITECT has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the OWNER) of all liens arising out of or filed in connection with the WORK.

14.9 FINAL PAYMENT AND ACCEPTANCE

A. If, on the basis of the ARCHITECT's observation of the WORK during construction and final inspection, and the ARCHITECT's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ARCHITECT is satisfied that the WORK has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ARCHITECT will, within 14 days after receipt of the final Application for Payment, indicate in writing the ARCHITECT's recommendation of payment and present the Application to the OWNER for payment.

- B. After acceptance of the WORK by the OWNER's governing body, the OWNER will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:
 - 1. Liquidated damages, as applicable.
 - 2. Two times the value of outstanding items of correction WORK or punch list items yet uncompleted or uncorrected, as applicable. All such WORK shall be completed or corrected to the satisfaction of the OWNER within the time stated on the Notice of Completion, otherwise the CONTRACTOR does hereby waive any and all claims to all monies withheld by the OWNER to cover the value of all such uncompleted or uncorrected items.

14.10 RELEASE OF RETAINAGE AND OTHER DEDUCTIONS

- A. After executing the necessary documents to initiate the lien period, and not more than 45 days thereafter (based on a 30-day lien filing period and 15-day processing time), the OWNER will release to the CONTRACTOR the retainage funds withheld pursuant to the Agreement, less any deductions to cover pending claims against the OWNER pursuant to Paragraph 14.5B.
- B. After filing of the necessary documents to initiate the lien period, the CONTRACTOR shall have 30 days to complete any outstanding items of correction WORK remaining to be completed or corrected as listed on a final punch list made a part of the Notice of Completion. Upon expiration of the 45 days, referred to in Paragraph 14.10A, the amounts withheld pursuant to the provisions of Paragraph 14.9B herein, for all remaining WORK items will be returned to the CONTRACTOR; provided, that said WORK has been completed or corrected to the satisfaction of the OWNER within said 30 days. Otherwise, the CONTRACTOR does hereby waive any and all claims for all monies withheld by the OWNER under the contract to cover 2 times the value of such remaining uncompleted or uncorrected items.
- 14.11 CONTRACTOR'S CONTINUING OBLIGATION. The CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ARCHITECT, nor the issuance of a Notice of Completion, nor any payment by the OWNER to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the WORK or any part thereof by the OWNER, nor any act of acceptance by the OWNER nor any failure to do so, nor any review of a Shop Drawing or sample submittal, will constitute an acceptance of WORK not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.
- 14.12 FINAL PAYMENT TERMINATES LIABILITY OF OWNER. Final payment is defined as the last progress payment made to the CONTRACTOR for earned funds, less monies withheld as applicable, pursuant to Paragraph 14.10A. The acceptance by the CONTRACTOR of the final payment referred to in Paragraph 14.9 herein, shall be a release of the OWNER and its agents from all claims of liability to the CONTRACTOR for anything done or furnished for, or relating to, the WORK or for any act of neglect of the OWNER or of any person relating to or affecting the WORK, except demands against the OWNER for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 14.9 herein; and excepting pending, unresolved claims filed prior to the date of the Notice of Completion.

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION

15.1 SUSPENSION OF WORK BY OWNER. The OWNER, acting through the ARCHITECT, may, at any time and without cause, suspend the WORK or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR. The CONTRACTOR shall resume the WORK on receipt from the ARCHITECT of a notice of resumption of WORK. The CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

15.2 TERMINATION OF AGREEMENT BY OWNER (CONTRACTOR DEFAULT)

- A. In the event of default by the CONTRACTOR, the OWNER may give 10 days written notice to the CONTRACTOR of OWNER's intent to terminate the Agreement and provide the CONTRACTOR an opportunity to remedy the conditions constituting the default. It shall be considered a default by the CONTRACTOR whenever CONTRACTOR shall: (1) declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors; (2) fail to provide materials or quality of WORK meeting the requirements of the Contract Documents; (3) disregard or violate provisions of the Contract Documents or ARCHITECT's instructions; (4) fail to prosecute the WORK according to the approved progress schedule; or, (5) fail to provide a qualified superintendent, competent workers, or materials or equipment meeting the requirements of the Contract Documents. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the OWNER may then issue the Notice of Termination.
- B. In the event the Agreement is terminated in accordance with Paragraph 15.2A, herein, the OWNER may take possession of the WORK and may complete the WORK by whatever method or means the OWNER may select. The cost of completing the WORK shall be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the OWNER. If such cost is less than the balance which would have been due, the CONTRACTOR shall pay the excess amount to the owner.
- 15.3 TERMINATION OF AGREEMENT BY OWNER (FOR CONVENIENCE). The OWNER may terminate the Agreement at any time if it is found that reasons beyond the control of either the OWNER or CONTRACTOR make it impossible or against the OWNER's interests to complete the WORK. In such a case, the CONTRACTOR shall have no claims against the OWNER except: (1) for the value of WORK performed up to the date the Agreement is terminated; and, (2) for the cost of materials and equipment on hand, in transit, or on definite commitment, as of the date the Agreement is terminated, which would be needed in the WORK and which meet the requirements of the Contract Documents. The value of WORK performed and the cost of materials and equipment delivered to the site, as mentioned above, shall be determined by the ARCHITECT in accordance with the procedure prescribed for the making of the final Application for Payment and payment under Paragraphs 14.8 and 14.9.
- 15.4 TERMINATION OF AGREEMENT BY CONTRACTOR. The CONTRACTOR may terminate the Agreement upon 10 days written notice to the OWNER, whenever: 1) the WORK has been suspended under the provisions of Paragraph 15.1, herein, for more than 90 consecutive days through

no fault or negligence of the CONTRACTOR, and notice to resume WORK or to terminate the Agreement has not been received from the OWNER within this time period; or, 2) the OWNER should fail to pay the CONTRACTOR any monies due to the CONTRACTOR in accordance with the terms of the Contract Documents and within 60 days after presentation to the OWNER by the CONTRACTOR of a request therefor, unless within said 10-day period the OWNER shall have remedied the condition upon which the payment delay was based. In the event of such termination, the CONTRACTOR shall have no claims against the OWNER except for those claims specifically enumerated in Paragraph 15.3, herein, and as determined in accordance with the requirements of said paragraph.

ARTICLE 16 MISCELLANEOUS

16.1 GIVING NOTICE. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

16.2 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

- A. The CONTRACTOR may use on the Project, with ARCHITECT's approval, such stone, gravel, sand, or other material determined suitable by the ARCHITECT, as may be found in the excavation. The CONTRACTOR will be paid for the excavation of such material at the corresponding contract unit price. No additional payment will be made for utilizing the material from excavation as borrow, or select borrow.
- B. The CONTRACTOR shall replace, at its own expense, with other acceptable material, all of that portion of the excavated material so removed and used which was needed for use on the Project. No charge for the materials so used will be made against the CONTRACTOR except that the CONTRACTOR shall be responsible for payment of any royalties required.
- C. The CONTRACTOR shall not excavate or remove any material from within the Project location which is not within the grading limits, as indicated by the slope and grade lines, without written authorization from the ARCHITECT.
- D. In the event the CONTRACTOR has processed materials from OWNER-furnished sources in excess of the quantities required for performance of this contract, including any waste material produced as a by-product, the CBJ may retain possession of such materials without obligation to reimburse the CONTRACTOR for the cost of their production. When such materials are in a stockpile, the ARCHITECT may require: that it remain in stockpile; the CONTRACTOR level such stockpile(s); or that the CONTRACTOR remove such materials and restore the premises to a satisfactory condition at the CONTRACTOR's expense. This provision shall not preclude the CBJ from arranging with the CONTRACTOR to produce material over and above the contract needs, payment for which shall be by written agreement between the CBJ and the CONTRACTOR.
- E. Unless otherwise provided, the material from any existing old structure may be used temporarily by the CONTRACTOR in the erection of the new structure. Such material shall not be cut or otherwise damaged except with the approval of the ARCHITECT.

- 16.3 RIGHT TO AUDIT. If the CONTRACTOR submits a claim to the OWNER for additional compensation, the OWNER shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR's books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plants, or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon Subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the OWNER deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the OWNER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the OWNER.
- 16.4 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, such as shell heaps, land or sea mammal bones or tusks, or other items of historical significance, the CONTRACTOR shall cease operations immediately and notify the ARCHITECT. No artifacts or specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the ARCHITECT order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra WORK, such order(s) shall be covered by an appropriate contract change document.
- 16.5 CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS. All WORK over, on, or adjacent to navigable waters shall be so conducted that free navigation of the waterways will not be interfered with and the existing navigable depths will not be impaired, except as allowed by permit issued by the U.S. Coast Guard and/or the U.S. Army Corps of Engineers, as applicable.
- 16.6 GRATUITY AND CONFLICT OF INTEREST. The CONTRACTOR agrees to not extend any loan, gratuity or gift of money of any form whatsoever to any employee or elected official of the OWNER, nor will the CONTRACTOR rent or purchase any equipment or materials from any employee or elected official of the OWNER, or to the best of the CONTRACTOR's knowledge, from any agent of any employee or elected official of the OWNER. Before final payment, the CONTRACTOR shall execute and furnish the OWNER an affidavit certifying that the CONTRACTOR has complied with the above provisions of the contract.

16.7 SUITS OF LAW CONCERNING THE WORK

- A. Should a suit of law be entered into, either by the CONTRACTOR (or the CONTRACTOR's surety) against the OWNER, or by the OWNER against the CONTRACTOR (or the CONTRACTOR's surety), the suit of law shall be tried in the First Judicial District of Alaska.
- B. If one of the questions at issue is the satisfactory performance of the WORK by the CONTRACTOR and should the appropriate court of law judge the WORK of the CONTRACTOR to be unsatisfactory, then the CONTRACTOR (or the CONTRACTOR's surety) shall reimburse the

OWNER for all legal and all other expenses (as may be allowed and set by the court) incurred by the OWNER because of the suit of the law and, further, it is agreed that the OWNER may deduct such expense from any sum or sums then, or any that become due the CONTRACTOR under the contract.

16.8 CERTIFIED PAYROLLS

- A. All CONTRACTORs or Subcontractor who perform work on a public construction contract for the OWNER shall file a Certified Payroll with the Alaska Department of Labor every two weeks. Before the second Friday, each CONTRACTOR and Subcontractor must file Certified Payrolls with Statements of Compliance for the previous two weeks. (Section 14-2-4 ACLA 1949; am Section 4 ch 142 SLA 1972).
- B. In lieu of submitting the State payroll form, the CONTRACTOR's standard payroll form may be submitted, provided it contains the information required by AS 36.05.040 and a statement that the CONTRACTOR is complying with AS 36.10.010.
- C. Any CONTRACTOR or Subcontractor, who performs work on public construction in the State, as defined by AS 36.95.010(3), shall pay not less than the current prevailing rate of wages as issued by the Alaska Department of Labor before the end of the pay period. (AS 36.05.010).

16.9 PREVAILING WAGE RATES

- A. Wage rates for Laborers and Mechanics on Public Contracts, AS 36.05.070. The CONTRACTOR, or Subcontractors, shall pay all employees unconditionally and not less than once a week. Wages may not be less than those stated in Paragraph 16.8C, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors. The scale of wages to be paid shall be posted by the CONTRACTOR in a prominent, easily accessible place at the site of the WORK.
- B. Failure to Pay Agreed Wages, AS 36.05.080. If it is found that a laborer, mechanic, or field surveyor employed by the CONTRACTOR or Subcontractor has been, or is being, paid a rate or wages less than the established rate, the OWNER may, by written notice, terminate the CONTRACTOR or Subcontractors right to proceed with the WORK. The OWNER may prosecute the WORK to completion by contract or otherwise, and the CONTRACTOR and sureties will be held liable to the OWNER for excess costs for completing the WORK. (Section 2 ch 52 SLA 1959).
- C. Listing CONTRACTORS Who Violate contracts, AS 36.05.090. In addition, a list giving the names of persons who have disregarded the rights of their employees shall be distributed to all departments of State government and all political subdivisions. No person appearing on this list, and no firm, corporation, partnership or association in which the person has an interest, may WORK as a CONTRACTOR or Subcontractor on a public construction contract for the State, or a political subdivision of the state, until three years after the date of publication of the list. (Section 3 ch 52 SLA 1959; am Section 9 ch 142 SLA).
- 16.10 EMPLOYMENT REFERENCE. Workers employed in the execution of the contract by the CONTRACTOR or by any Subcontractor under this contract shall not be required or permitted to labor more than 8 hours a day or 40 hours per week in violation of the provisions of the Alaska Wage and Hour Act, Section 23.10.060.

16.11 COST REDUCTION INCENTIVE

- A. At any time within 45 days after the date of the Notice of Award, the CONTRACTOR may submit to the ARCHITECT in writing, proposals for modifying the plans, specifications, or other requirements of this contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair in any manner the essential functions or characteristics of the project, including but not limited to, service life, economy of operation, ease of maintenance, desired appearance or design and safety standards.
- B. The cost reduction proposal shall contain the following information:
 - 1. Description of both the existing contract requirements for performing the WORK and the proposed changes.
 - 2. An itemization of the contract requirements that must be changed if the proposal is adopted.
 - 3. A detailed estimate of the time required and the cost of performing the WORK under both the existing contract and the proposed change.
 - 4. A statement of the date by which the CONTRACTOR must receive the decision from the OWNER on the cost reduction proposal.
 - 5. The contract items of WORK effected by the proposed changes including any quantity variations.
 - 6. A description and estimate of costs the OWNER may incur in implementing the proposed changes, such as test and evaluation and operating and support costs.
 - 7. A prediction of any effects the proposed change would have on future operations and maintenance costs to the OWNER.
- C. The provisions of this section shall not be construed to require the OWNER to consider any cost reduction proposal which may be submitted; nor will the OWNER be liable to the CONTRACTOR for failure to accept or act upon any cost reduction proposal submitted, or for delays to the WORK attributable to the consideration or implementation of any such proposal.
- D. If a cost reduction proposal is similar to a change in the plans or Specifications for the Project under consideration by the OWNER at the time the proposal is submitted, the OWNER will not accept such proposal and reserves the right to make such changes without compensation to the CONTRACTOR under the provisions of this section.
- E. The CONTRACTOR shall continue to perform the WORK in accordance with the requirements of the contract until an executed Change Order incorporating the cost reduction proposal has been issued. If any executed Change Order has not been issued by the date upon which the CONTRACTOR's cost reduction proposal specifies that a decision should be made by the OWNER, in writing, the cost reduction proposal shall be considered rejected.
- F. The OWNER, shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in Contract Time and construction costs resulting from the adoption of all or any part of such proposal. Should the CONTRACTOR disagree with OWNER's decision on the cost reduction proposal, there is no further consideration. The OWNER reserves the right to make final determination.
- G. If the CONTRACTOR's cost reduction proposal is accepted in whole or in part, such acceptance will be made by a Contract Change Order, which specifically states that the change is executed pursuant

to this cost reduction proposal section. Such Change Order shall incorporate the changes in the plans and Specifications which are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect and shall include any conditions upon which the OWNER's approval is based, if such approval is conditional. The Change Order shall also describe the estimated net savings in the cost of performing the WORK attributable to the cost reduction proposal, and shall further provide that the contract cost be adjusted by crediting the OWNER with the estimated net savings amount.

- H. Acceptance of the cost reduction proposal and performance of the WORK does not extend the time of completion of the contract, unless specifically provided in the Change Order authorizing the use of the submitted proposal. Should the adoption of the cost reduction proposal result in a Contract Time savings, the total Contract Time shall be reduced by an amount equal to the time savings realized.
- I. The amount specified to the CONTRACTOR in the Change Order accepted in the cost reduction proposal shall constitute full compensation for the performance of WORK. No claims for additional costs as a result of the changes specified in the cost reduction proposal shall be allowed.
- J. The OWNER reserves the right to adopt and utilize any approved cost reduction proposal for general use on any contract administered when it is determined suitable for such application. Cost reduction proposals identical, similar, or previously submitted will not be accepted for consideration if acceptance and compensation has previously been approved. The OWNER reserves the right to use all or part of any cost reduction proposal without obligation or compensation of any kind to the CONTRACTOR.
- K. The CONTRACTOR shall bear the costs, if any, to revise all Bonds and insurance requirements for the Project, to include the cost reduction WORK.

END OF SECTION

GENERAL. These Supplementary General Conditions make additions, deletions, or revisions to the General Conditions as indicated herein. All provisions which are not so added, deleted, or revised remain in full force and effect. Terms used in these Supplementary General Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SGC 2.2 COPIES OF DOCUMENTS. Add the following:

The OWNER shall furnish to the CONTRACTOR up to ten (10) copies of the Contract Documents which may include bound reduced Drawings, if any. The CBJ Contracts Office shall contact the CONTRACTOR after issuance of Notice of Intent to Award to determine how many copies are needed. Additional quantities of the Contract Documents will be furnished at reproduction cost.

SGC 4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES. *Add* the following:

C. In the preparation of the Contract Documents, the Architect of Record has relied upon field measurements and visual inspection of the existing structures and surface conditions.

Add the following SGC 4.6:

SGC - 4.6 USE OF THE CBJ/STATE LEMON CREEK GRAVEL PIT. Add the following.

The CBJ/State Lemon Creek Gravel Pit is not available for this Project.

SGC 5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS. The Contractor shall furnish Performance and Payment Bonds in the amount of 100% of the Bid.

SGC 5.2 INSURANCE AMOUNTS. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations. All certificates of insurance supplied to the OWNER shall state that the OWNER is named as "Additional Insured for any and all work performed for the City & Borough of Juneau." The Additional Insured requirement does not apply to Workers Compensation insurance. NOTE: This requirement has changed. The OWNER no longer requires certificates of insurance referencing project names and contract numbers.

- Workers' Compensation: Under Paragraph 5.2C.1 of the General Conditions as in accordance with AS 23.30.045: (Additional Insured requirements not necessary for Workers' Compensation coverage.)
 - 1. State: Statutory
 - 2. Applicable Federal (e.g., Longshore): Statutory

Note: If the WORK called for in the Contract Documents involves work in or on any navigable waters, the CONTRACTOR shall provide Workers' Compensation coverage which shall include coverage under the Longshore and Harbor Workers' Compensation Act, the Jones Act, and any other coverage required under Federal or State laws pertaining to workers in or on navigable waters.

3. Employer's Liability

Bodily Injury by Accident:	\$100,000.00	Each Accident
Bodily Injury by Disease:	\$100,000.00	Each Employee
Bodily Injury by Disease:	\$500,000.00	Policy Limit

- a. CONTRACTOR agrees to waive all rights of subrogation against the OWNER of Record for work performed under contract.
- b. If CONTRACTOR directly utilizes labor outside of the State of Alaska in the prosecution of the WORK, "Other States" endorsement shall be required as a condition of the contract.
- B. Commercial General Liability: (under Paragraph 5.2C.2 of the General Conditions):

1.	General Policy	\$1,000,000.00 \$2,000,000.00	Each Occurrence Annual Aggregate
2.	Products/Completed Operations	\$1,000,000.00 \$2,000,000.00	Each Occurrence Annual Aggregate
3.	Personal Injury	\$1,000,000.00	Each Occurrence

- C. Comprehensive Automobile Liability: (under Paragraph 5.2C.3 of the General Conditions) including Owned, Hired, and Non-Owned Vehicles:
 - 1. Combined Single Limit, Bodily Injury and Property Damage \$1,000,000.00

The CONTRACTOR shall require each Subcontractor similarly to provide Commercial Automobile Liability Insurance for all of the latter's employees to be engaged in such WORK unless such employees are covered by the protection afforded by the CONTRACTOR's Commercial Automobile Liability Insurance.

- D. Builder's Risk: (under Paragraph 5.2C.5 of the General Conditions) in an amount equal to the completed value of the BID. Flood and earthquake shall be excluded as a requirement of the Builder's Risk policy.
- E. Policies shall also specify insurance provided by CONTRACTOR will be considered primary and not contributory to any other insurance available to the OWNER.
- F. All policies will provide for 30 Days written notice prior to any cancellation or non-renewal of insurance policies required under contract. "Will endeavor" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the Company, its agents or representatives" wording will be deleted from certificates.
- G. Contractor's Pollution Legal Liability: \$1,000,000 per occurrence, \$2,000,000 policy aggregate.

SGC 6.1 SUPERVISION AND SUPERINTENDENCE. Add the following:

D. The CONTRACTOR's superintendent shall attend a weekly progress meeting at the site with the OWNER and/or the ARCHITECT at a time to be mutually agreed upon. The CONTRACTOR's superintendent shall have an operating cellular phone on hand at all times that WORK is performed.

SGC 6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS. Add the following:

The CONTRACTOR shall perform not less than 40% of the WORK with its own forces (i.e., without subcontracting). The 40% requirement shall be understood to mean that the CONTRACTOR shall perform, with its own organization, WORK amounting to at least 40% of the original contract amount. The 40% requirement will be calculated based upon the total of the subcontract amounts submitted for Contract Award, and any other information requested by the OWNER from the apparent low Bidder.

SGC 6.6 PERMITS. Add the following:

- C. The OWNER shall apply for, and obtain, the necessary building permit for this Project; however, the CONTRACTOR is responsible for scheduling and coordinating all necessary inspections. The CBJ Inspection number is 586-1703. All other provisions of this section remain in effect.
- D. Contractor is responsible for obtaining a Hot Works permit from the CBJ Permit Center, if performing work which requires such a permit. Work requiring a Hot Works Permit includes but is not limited to the following: cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar activity.

SGC 6.8 LAWS AND REGULATIONS. Add the following:

The OWNER may, per AS 36.30, audit the CONTRACTOR's or Subcontractor(s) records that are related to the cost or pricing data for this contract, all related Change Orders, and/or contract modifications.

SGC 6.15 CONTRACTOR'S DAILY REPORTS. Add the following:

"Weekly summary reports may be completed in lieu of daily reports."

Add the following SCG 6.19:

SGC 6.19 CONTRACTOR'S WORK SCHEDULE LIMITATIONS. Construction of Buildings and Projects. It is unlawful to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or similar heavy construction equipment before 7:00 a.m. or after 10:00 p.m., Monday through Friday, or before 9:00 a.m. or after 10:00 p.m., Saturday and Sunday, unless a permit shall first be obtained from the City and Borough Building Official. Such permit shall be issued by the Building Official only upon a determination that such operation during hours not otherwise permitted hereunder is necessary and will not result in unreasonable disturbance to surrounding residents. CONTRACTOR's work schedule is further addressed in Section 011000 - Summary

SGC 9.3 PROJECT REPRESENTATION. Add the following:

DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF INSPECTOR

General. The Inspector will act as directed by and under the supervision of the ARCHITECT and will confer with the ARCHITECT regarding its actions. The Inspector's dealings in matters pertaining to the on-site WORK shall, in general, be only with the ARCHITECT and the CONTRACTOR, and dealings with Subcontractors shall only be through or with the full knowledge of the CONTRACTOR. Written communication with the OWNER will be only through or as directed by the ARCHITECT. The ARCHITECT may further delegate the responsibilities and authorities associated with this Project, when such delegation is in writing and notice thereof is provided to the CONTRACTOR.

SGC 11.1 GENERAL. Paragraph B. In the second sentence change the number of days from 30 Days to 7 Days. In the third sentence change the number of days from 60 Days to 14 Days.

SGC 13.4 OWNER MAY STOP THE WORK. *Add* Paragraph A below:

A. The CONTRACTOR will be assessed a monetary penalty for the actual cost impacts to Bartlett Regional Hospital caused by disruption, delays, and/or loss of operating revenue to Bartlett Regional Hospital and the replacement of damaged property and equipment due to construction. This includes but is not limited to: Water leaks into the building as a result of CONTRACTOR's WORK, disturbance to Bartlett Regional Hospital patients and staff in critical areas of the hospital due to excessive noise, fumes, mechanical, electrical, sprinkler or life safety systems interruption.

SCG 14.3 APPLICATION FOR PROGRESS PAYMENT. *Delete* Paragraph C and replace with the following:

- C. The Net Payment Due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the total amount of all previous payments made to the CONTRACTOR. Progress payments will be paid in full in accordance with Article 14 of the General Conditions until 90% of the Contract Price has been paid. The remaining 10% of the contract amount may be withheld until:
 - 1. final inspection has been made;
 - 2. completion of the Project; and
 - 3. acceptance of the Project by the OWNER.

SCG 14.3 APPLICATION FOR PROGRESS PAYMENT. Paragraph D.

D. The Value of Materials Stored at the site shall be the amount of 90%. If stored off-site, the Value of Materials Stored shall be the amount of not more than 75%

SGC 14.9 FINAL PAYMENT AND ACCEPTANCE. Add the following paragraph:

C. Prior to the final payment the CONTRACTOR shall contact the Alaska Department of Labor and Workforce Development (ADOL) and provide the OWNER with clearance from the ADOL for the CONTRACTOR and all Subcontractors that have worked on the Project. This clearance shall indicate that all Employment Security Taxes have been paid. The following page is a sample form for this purpose. The CONTRACTOR also shall submit a "NOTICE OF COMPLETION OF PUBLIC WORKS" signed by ADOL.

SGC 16.8 CERTIFIED PAYROLLS. Change paragraph A. to read:

A. All CONTRACTORs or Subcontractors who perform work on a public construction contract for the OWNER shall file a certified payroll with Alaska Department of Labor. See Section 00830 - Alaska Labor Standards, Reporting, and Prevailing Wage Rate Determination.

SGC 16.12 EQUAL EMPLOYMENT OPPORTUNITY (EEO)

The CONTRACTOR may not discriminate against any employee or applicant for employment because of race, religion, color, national origin, age, disability, sex, marital status, changes in marital status,

pregnancy or parenthood. The CONTRACTOR shall post a notice setting out the provisions of this paragraph in a conspicuous place available to employees and applicants for employment.

The CONTRACTOR and each Subcontractor shall state in all solicitations and advertisements for employees to work on this Project, that it is an Equal Opportunity Employer and that all qualified applicants will receive consideration for employment without regard to race, religion, color, national origin, age, disability, sex, marital status, changes in marital status, pregnancy or parenthood.

The CONTRACTOR shall include the provisions of this EEO article in every contract relating to this Project and shall require the inclusion of these provisions in every agreement entered into for this Project, so that those provisions will be binding upon the CONTRACTOR and each Subcontractor.

Add the following SGC 17:

SGC 17 GENERAL INFORMATION. This Project is currently funded by Bartlett Regional Hospital, Capital Project Fund.

Employment Security Tax Clearance

Date:			
To:	Alaska Department of Labor Juneau Field Tax Office 907-465-2787 FAX 907-465-2374		
From:			
Subject:	Bartlett Regional Hospital Roof Contract No. E11-286	Replacement	
Timeframe of	f Contract		
	whether or not clearance is granted for <i>CONTRACTOR or Subcontractor lis</i>		TRACTOR or Subcontractor:
Name	Ā	ddress	
	.265 of the Alaska Employment Secu ke final payment for WORK performe		
Jennifer Man Engineering l 155 S. Sewar Juneau, Alasl FAX 907-586	d Street ka 99801		
	rance is granted. rance is NOT granted.		
Remarks:			
Signature			Date
Title	END O	FSECTION	

SECTION 00830 - ALASKA LABOR STANDARDS, REPORTING, AND PREVAILING WAGE RATE DETERMINATION

State of Alaska, Department of Labor, Laborers' and Mechanics' Minimum Rates of Pay, AS 36.05.010 and AS 36.05.050, Wage and Hour Administration Pamphlet No. 600, the latest edition published by the State of Alaska, Department of Labor inclusive, are made a part of this contract by reference.

The CONTRACTOR is responsible for contacting the Alaska Department of Labor to determine compliance with current regulations.

Correspondence regarding Title 36 requirements may be submitted electronically or paper copies can be submitted by mail. To submit Title 36 documents electronically, go to https://myalaska.state.ak.us/home/app. If filing electronically, submit certified payrolls to ADOL at the website above and email a copy of all certified payrolls to Jennifer Mannix at the email address below. If Contractor elects to submit paper copies, they should be submitted to the physical addresses below.

Within 10 Days of "Notice of Award/Notice to Proceed" make a list of <u>all</u> Subcontractors. Include their name, address, phone, estimated subcontract amount, and estimated start and finish dates. Send this list to the Wage and Hour Section (contact information below).

Certified Payrolls must be submitted every two weeks. Before the second Friday, each CONTRACTOR and Subcontractor must file Certified Payrolls with Statements of Compliance for the previous two weeks. Indicate *"Start"* on your first payroll, and *"Final"* on your last payroll for this Project.

As part of the **final payment request package**, CONTRACTOR must submit a "NOTICE OF COMPLETION OF PUBLIC WORKS" form signed by ADOL personnel.

Contact Information:

Wage and Hour Section State of Alaska Department of Labor and Workforce Development Labor Standards and Safety Division and Wage and Hour Administration P.O. Box 11149 Juneau, AK 99811-1149 907-465-4842 http://labor.state.ak.us/lss/home.htm Jennifer Mannix, Contract Administrator City and Borough of Juneau 155 S. Seward Street Juneau, AK 99801 (907) 586-0873 jennifer_mannix@ci.juneau.ak.us

END OF SECTION

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Project information.
 - 2. WORK covered by Contract Documents.
 - 3. WORK by OWNER.
 - 4. WORK under separate contracts.
 - 5. OWNER-furnished products.
 - 6. Access to site.
 - 7. Coordination with occupants.
 - 8. WORK restrictions.
 - 9. Contractor use of project site.
 - 10. Specification and drawing conventions.
- B. Related Sections:
 - 1. Section 012000 Project Meetings for required preconstruction, progress, and preinstallation meetings.
 - 2. Section 015000 Temporary Facilities and Controls for limitations and procedures governing temporary use of OWNER'S facilities.
 - 3. Mechanical and Electrical Divisions for additional work restrictions.

1.3 PROJECT INFORMATION

- A. Project Identification: Bartlett Regional Hospital, Roof Replacement Project.
 - 1. Project Location: The site of WORK is 3260 Hospital Drive Juneau, Alaska 99801.
- B. OWNER: City and Borough of Juneau, 155 South Seward St. Juneau, Alaska 99801
 - 1. OWNER'S Representative: Steve Tada, CBJ Project Manager.
- C. Architect of Record: Jensen Yorba Lott, Inc., 522 West 10th St. Juneau, Alaska 998021.
- D. Using Agency: Bartlett Regional Hospital.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project is defined by the Contract Documents and consists of renovation of the indicated areas, systems, and components at the existing Bartlett Regional Hospital to allow the Roof Replacement of the 1968 and 1987 Buildings.

- B. The WORK will include but is not limited to; removal of the existing IRMA roof system down to the structural roof deck; installation of a sloping insulated fully adhered single ply roof membrane roofing system to drains, over the existing sloping structural roof deck with associated sheet metal flashing; raising and modifying the roof top heat traced insulated chilled water piping systems; extending plumbing vent through roofs; roof drainage work; removal and reinstallation of mechanical roof caps and exhaust fan on insulated curbs; electrical services to maintain a clear height to the roof membrane; and metal wall panel over the existing penthouse Z-1 and over the existing precast wall panels of the 1968 building above the 1987 building.
- C. The WORK shall be constructed under a single prime Contract.

1.5 WORK BY OWNER

- A. General: Cooperate fully with OWNER so WORK may be carried out smoothly, without interfering with or delaying WORK under this Contract or work by OWNER. Coordinate the WORK of this Contract with work performed by OWNER.
- B. Preceding WORK: OWNER will perform the following construction operations at Project site prior to the start of WORK of this Contract.
 - 1. Removal and Reinstallation of the communication towers, equipment and wiring
 - 2. Removal of indicated hospital equipment.
- C. Concurrent WORK: OWNER will perform the following construction operations at Project site simultaneously with WORK under this Contract.
 - 1. CT SCAN RENOVATION Project.

1.6 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate CONTRACTORS working on other projects at the Hospital so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the WORK of this Contract with work performed under separate contracts. Refer in particular to "Work Restrictions" section below for sequencing of WORK relative to OWNER occupation of the spaces below and adjacent to this WORK

1.7 OWNER-FURNISHED PRODUCTS

A. OWNER will furnish products indicated. The WORK includes receiving, unloading, handling, storing, protecting, and installing OWNER-furnished products and making building services connections as required.

1.8 CONTRACTOR-SALVAGED, CONTRACTOR-INSTALLED PRODUCTS

A. CONTRACTOR shall salvage the existing mechanical and electrical in the area of WORK on the roofs of the 1968 and 1987 Building as part of this project. CONTRACTOR shall store products for re-installation where indicated so that the re-installed products match existing products indicated to remain. Only those quantities of products required to be re-installed shall

- B. CONTRACTOR-Salvaged, CONTRACTOR-Installed Products:
 - 1. Piping (chiller), associated equipment and materials.
 - 2. Misc roof top mechanical equipment and materials.
 - 3. Electrical conduit, wiring and equipment and materials.

1.9 ACCESS TO SITE

- A. General: CONTRACTOR shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to areas indicated for demolition and/or construction. Limit staging to CONTRACTOR Staging Area; Temporary Construction Stair to Roof; and Construction Waste indicated on sheet A-003.
 - 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to OWNER, Using Agency and its employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials, except where existing driveways, sidewalks and entrances are schedule for demolition and/or improvements.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
 - 1. Provide protection to existing facility, with special care for protection of windows in area of Temporary Construction Stair to Roof and Construction Waste.

1.10 COORDINATION WITH OCCUPANTS

- A. Partial OWNER Occupancy: Using Agency will occupy the premises during entire construction period. Cooperate with OWNER during construction operations to minimize conflicts and facilitate OWNER usage. Perform the WORK so as not to interfere with Using Agency operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from OWNER and approval of authorities having jurisdiction.

- 2. Notify the OWNER not less than 72 hours in advance of activities that will affect OWNER'S operations.
 - a. Activities will not commence without written acknowledgement and permission of the OWNER.
- B. OWNER Limited Occupancy of Completed Areas of Construction: OWNER reserves the right to occupy and to place and install equipment in completed portions of the WORK, prior to Substantial Completion of the WORK, provided such occupancy does not interfere with completion of the WORK. Such placement of equipment and limited occupancy shall not constitute acceptance of the total WORK.
- C. OWNER will prepare a Certificate of Substantial Completion for the WORK to be occupied prior to OWNER acceptance of the completed WORK.
 - 1. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited OWNER occupancy.
 - 2. Before limited OWNER occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, OWNER will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 3. On occupancy, OWNER will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.11 WORK RESTRICTIONS:

- A. OWNER will occupy the areas below and adjacent to the WORK the entire construction period. WORK shall be limited not only to WORK space but also to WORK hours. WORK shall be coordinated with OWNER. OWNER reserves the right to stop work in a specific area on a short notice to coordinate with ongoing BRH use.
 - 1. Coordinate with OWNER at the end of each day before proceeding with WORK on the next day.
 - 2. WORK on Spaces above the areas designated as "Office and/or Public" on Sheet A601, weekdays Monday through Friday, WORK may occur as is allowed by CBJ noise restrictions; and impact and noise levels as further defined.
 - 3. WORK on Spaces above the areas designated as "Patient Sleep Rooms" on sheet A601 will be scheduled and coordinated; and will be limited.
 - a. Obtain OWNER's written permission before proceeding WORK.
 - b. WORK may occur seven (7) days a week between 7:00 am and 8:59 pm.
 - c. WORK which will create impact or sound levels greater than 60 Db, WORK will be allowed on Saturday and Sunday only, no earlier than 9:00 am and no later than 5:30 pm.
 - 4. WORK on Spaces above the areas designated as "Sleep Lab" on sheet A601 will be scheduled and coordinated; and will be limited to non scheduled patient periods.
 - a. Obtain OWNER's written permission before proceeding with WORK.
 - b. On weekdays, Monday through Friday; WORK in this space will be no earlier than 7:00 am and not later than 7:00 pm daily.

- c. On weekends WORK in this space is limited to 7:00 am Saturday through 4:30 pm Monday.
- d. WORK which will create impact or sound levels greater than 60 Db, WORK will be allowed on Saturday and Sunday only, no earlier than 9:00 am and no later than 5:30 pm.
- 5. WORK on Spaces above the areas designated as "Surgery" on sheet A601 will be scheduled and coordinated; and will be limited to non scheduled patient periods.
 - a. Obtain OWNER's written permission before proceeding with WORK.
 - b. For WORK in this area, the following are the WORK hours which may be revised per scheduled and non scheduled Surgery.
 - 1) It is the intent to not schedule WORK above Surgery while Surgeries are in progress.
 - c. On weekdays, Monday through Thursday; WORK in this space will be no earlier than 5:30 pm and not later than 6:59 am daily.
 - d. On weekends WORK in this space may be limited to 5:30 pm Friday through 6:59 am Monday.
 - 1) WORK on Saturday will need to be scheduled weekly.
 - e. WORK which will create impact or sound levels greater than 60 Db, WORK will be allowed on Saturday and Sunday only, no earlier than 9:00 am and no later than 5:30 pm.
- 6. For WORK which will create impact and sound levels greater than 60 dB, WORK will be allowed no earlier than 9:00 am and no later than 5:30 pm unless specifically approved otherwise by the OWNER.
- 7. WORK may be enclosed from adjacent spaces at CONTRACTOR option, by use of temporary enclosures complying with section 015000 Temporary Facilities and Controls until such time as WORK is completed.
 - a. Seal all penetrations and opening into occupied spaces, while maintaining air pressure in enclosed WORK spaces.
- 8. All fire protection, mechanical, electrical, lighting, life safety and OWNER's services; shall be maintained and be completely operational during WORK in this space except as otherwise allowed in the Contract Documents.

1.12 CONTRACTOR USE OF PROJECT SITE

- A. The CONTRACTOR's use of the Project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.
- B. Maintain existing buildings in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the structure and its occupants during the construction period.

- C. Limit use of the site and/or premises to construction activities in areas indicated on the contract Drawings; allow for OWNER occupancy and use by the public.
- D. Confine operations to areas within the Project limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
- E. Keep driveways and entrances serving the premises clear and available to the OWNER and the OWNER's employees at all times. Do not use these areas for parking or storage of materials and equipment on the site.
- F. Existing Plumbing, Mechanical and Electrical Interruptions: Do not interrupt mechanical and electrical serving facilities occupied by OWNER or others unless permitted under the following conditions and then only after providing temporary services according to requirements indicated:
 - 1. Notify OWNER not less than three days in advance of proposed plumbing, mechanical and electrical interruptions.
 - a. Provide written and diagrammatic indication of interruption with schedule.
 - 2. Obtain OWNER's written acknowledgement and permission before proceeding with plumbing, mechanical and electrical interruptions.
- G. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by OWNER or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify OWNER not less than three days in advance of proposed utility interruptions.
 - 2. Obtain OWNER's written acknowledgement and permission before proceeding with utility interruptions.
- H. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to OWNER occupancy with OWNER.
 - 1. Notify OWNER not less than three days in advance of proposed disruptive operations.
 - 2. Obtain OWNER's written permission before proceeding with disruptive operations.
- I. Tobacco-Free Building and Grounds: Smoking or any other use of tobacco is not permitted within the building or within hospital grounds.
- J. Employee Identification: See other provisions in Division 1 for requirements.

1.13 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by CONTRACTOR unless specifically stated otherwise.

- B. Division 1 General Requirements: Requirements of Sections in Division 1 apply to the WORK of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 REQUIREMENTS INCLUDED

- A. CONTRACTOR participation in preconstruction conferences.
- B. CONTRACTOR administration of progress meetings and pre-installation conferences.

1.3 PRECONSTRUCTION CONFERENCES

A. The CBJ Project Manager will administer one preconstruction & site mobilization conference which will be held at Bartlett Regional Hospital. Conference will be held for clarification of CONTRACTOR responsibilities in use of site, confirming extent of use of site, and for review of administrative procedures.

1.4 PROGRESS MEETINGS

- A. Schedule and administer Project meetings throughout progress of WORK as follows:
- B. Schedule weekly on-site progress meetings on a consistent day and time with the OWNER and/or Architect of Record.
- C. Attendance: Job superintendent, major Subcontractors and Suppliers; OWNER and Consultants as appropriate to agenda topics for each meeting.
- D. Make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, and distribute copies within three days to CBJ Project Manager, the Architect of Record, participants, and those affected by decisions made at meetings. CBJ Project Manager will record, prepare, and distribute meeting minutes.
- E. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

1.5 PREINSTALLATION CONFERENCES

- A. When required in individual Specification section, or directed by the CBJ Project Manager, convene a pre-installation conference prior to commencing Work of the section.
- B. Require attendance of entities directly affecting, or affected by, Work of the section.

Section 012000 - PROJECT MEETINGS

C. Review conditions of installation, preparation and installation procedures, and coordination with related Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012000

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SCOPE

- A. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of WORK being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- B. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefor shall be included in the prices named in the Bid Schedule for the various appurtenant items of WORK.
- C. In addition to other incidental items of WORK listed elsewhere in the contract, the following items shall also be considered as incidental to other Items of WORK under this contract:
 - 1. Maintenance of all services through Project area including water, sewer, storm, garbage pickup, mail delivery, other deliveries, and emergency vehicles.

1.2 BASE BID: PRICE BASED ON LUMP SUM PAY UNIT

- A. Measurement for payment for the Lump Sum Pay Unit will be based upon the completion of the entire WORK as a Lump Sum Pay Unit, complete, all in accordance with the requirements of the Contract Documents.
- B. Payment will be made at the amount shown on the Bid Schedule, which payment will constitute full compensation for all WORK.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013201 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. This Section defines the process whereby the Schedule of Values (Lump Sum Pay Unit price breakdown) shall be developed and ultimately incorporated into the cost loading function of the schedule as specified in Section 013211 – CPM Construction Schedule. Monthly progress payment amounts shall be determined from the monthly progress updates of the schedule activities.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 011000 Summary.
- B. Section 012000 Project Meetings.
- C. Section 013211 CPM Construction Schedule.

1.3 PRELIMINARY SCHEDULE OF VALUES

- A. The Schedule of Values shall be developed in two (2) steps independent but parallel with the development of the schedule activities and logic. The steps shall be as follows:
 - 1. The CONTRACTOR shall submit a preliminary Schedule of Values for the major components of the WORK at the Preconstruction Conference. The listing shall include, at a minimum, the proposed value for the major WORK components, listed by specification section at a minimum.
 - 2. The CONTRACTOR and ARCHITECT shall meet and jointly review the preliminary Schedule of Values and make any adjustments in value allocations necessary, if in the opinion of the ARCHITECT, allocation adjustments are necessary to establish fair and reasonable allocation of values for the major WORK components. Front end loading will not be permitted. The ARCHITECT may require inclusion of other major WORK components not included in the above listing if, in the opinion of the ARCHITECT, such additional components are appropriate. This review and any necessary revisions shall be completed within 10 Days from the date of Notice to Proceed.

1.4 DETAILED SCHEDULE OF VALUES

A. The CONTRACTOR shall prepare and submit a detailed Schedule of Values to the ARCHITECT within 21 Days from the date of the Notice to Proceed. The detailed Schedule of Values shall be based on the accepted preliminary Schedule of Values for major WORK components. Because the ultimate requirement is to develop a detailed Schedule of Values sufficient to determine appropriate monthly progress payment amounts through cost loading of the CPM Schedule activities, sufficient detailed breakdown shall be provided to meet this requirement. The ARCHITECT shall be the sole judge of acceptable numbers, details and description of values established. If, in the opinion of the ARCHITECT, a greater number of Schedule of Values items than proposed by the

SCHEDULE OF VALUES Page 013201-1

SECTION 013201 - SCHEDULE OF VALUES

CONTRACTOR is necessary, the CONTRACTOR shall add the additional items so identified by the ARCHITECT.

- B. The CONTRACTOR and ARCHITECT shall meet and jointly review the detailed Schedule of Values within 30 Days from the Notice to Proceed. The value allocations and extent of detail shall be reviewed to determine any necessary adjustments to the values and to determine if sufficient detail has been proposed to provide cost loading of the CPM Schedule activities. Any adjustments deemed necessary to the value allocation or level of detail shall be made by the CONTRACTOR and a revised detailed Schedule of Values shall be submitted within 40 Days from the date of Notice to Proceed.
- C. Following acceptance of the detailed Schedule of Values, the CONTRACTOR shall incorporate the values into the cost loading portion of the CPM Schedule. The CPM activities and logic shall have been developed concurrent to the development of the detailed Schedule of Values; however, it will likely be necessary to adjust the detailed Schedule of Values to correlate to individual schedule activities. It is anticipated that instances will occur, due to the independent but parallel development of the Schedule of Values and the CPM Schedule activities, where interfacing these two documents will require changes to each document, Schedule activities may need to be added to accommodate the detail of the Schedule of Values. Schedule of Values items may need to be added to accommodate the detail of the CPM Schedule activities. Where such instances arise, the CONTRACTOR shall propose changes to the Schedule of Values and to the CPM Schedule activities to satisfy the CPM Schedule cost loading requirements.

1.5 CROSS REFERENCE LISTING

- A. To assist in the correlation of the Schedule of Values and the CPM Construction Schedule, the CONTRACTOR shall provide a Cross Reference Listing which shall be furnished in two parts. The first part shall list each scheduled activity with the breakdown of the respective valued items making up the total cost of the activity. The second part shall list the valued items with the respective scheduled activity or activities that make up the total cost for a valued item (shown in the Schedule of Values). The total cost for each scheduled item should be indicated.
- B. These listings shall be updated and submitted in conjunction with monthly submittals as stated in Section 013211 CPM Construction Schedule.
- C. Approved change orders reflected in the CPM Schedule shall be incorporated into the Schedule of Values as single units each identified by the Change Order number.

1.6 CHANGES TO SCHEDULE OF VALUES

- A. Changes to the CPM Schedule which add activities not included in the original schedule but included in the original WORK (schedule omissions) shall have values assigned as approved by the ARCHITECT. Other activity values shall be reduced to provide equal value adjustment increases for added activities as approved by the ARCHITECT.
- B. In the event that the CONTRACTOR and ARCHITECT agree to make adjustments to the original Schedule of Values because of inequities discovered in the original accepted detailed Schedule of Values, increases and equal decreases to values for activities may be made.

1.7 LIQUIDATED DAMAGES

A. If any submittal that is required by this Section is determined by the ARCHITECT to be incomplete or is submitted later than set out herein, the OWNER will suffer financial loss and the CONTRACTOR will be assessed liquidated damages as required by Article 4 of the Section 00500 - Agreement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013201

PART 1 - GENERAL

1.1 GENERAL

A. The scheduling of the WORK under the contract shall be performed by the CONTRACTOR in accordance with the requirements of this Section. The development of the schedule, the cost loading of the schedule, monthly payment request requisitions and Project status reporting requirements of the contract shall employ computerized Critical Path Method (CPM) scheduling. The CPM Schedule shall be cost loaded based on the Schedule of Values as approved by the ARCHITECT in accordance with the requirements of Section 013201 - Schedule of Values. The CPM Schedule and all reports should be prepared with Primavera, MS Project 2003, or other software approved by the ARCHITECT with substantially similar functions.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 011000 Summary, in particular the section on Work Restrictions.
- B. Section 013201 Schedule of Values.

1.3 QUALIFICATIONS

A. Within 10 calendar days after the date of the Notice of Intent to Award letter, the CONTRACTOR shall provide a statement which verifies that the CONTRACTOR has in-house capability qualified to use CPM technique and the approved software, or that the CONTRACTOR will employ a CPM consultant so qualified. In either event the statement shall identify the individual who will perform the CPM scheduling. Capability shall be verified by description of construction projects on which the individual has successfully applied computerized CPM and shall include at least two projects of similar nature, scope and valued at not less than one-half the expected cost of this Project.

1.4 INITIAL SCHEDULE SUBMITTALS

- A. The CONTRACTOR shall submit a Project Overview Bar Chart Schedule prior to the Pre-Construction Conference as specified below:
 - 1. Project Overview Bar Chart: The overview bar chart shall indicate the major components of the Project WORK and the sequence relations between major components and subdivisions of major components. The overview bar chart shall indicate the relationships and time frames in which the various components of the WORK will be made substantially complete and placed into service in order to meet the Project milestones. Planned durations and start dates shall be indicated for each WORK item.

1.5 CPM SCHEDULE SUBMITTALS

A. Original CPM Schedule Submittal: Within 14 days after the Notice to Proceed letter, the CONTRACTOR shall submit for review by the ARCHITECT a hard copy of the CPM Network Schedule. The CONTRACTOR's attention is directed to the requirement that the schedule shall contain sufficient detail and information to cost load the CPM schedule in accordance with the

approved Schedule of Values as specified under Section 013201 - Schedule of Values. Each installation and side WORK activity shall have been cost loaded as specified.

- B. Acceptance: The acceptance of the CONTRACTOR's schedule by the ARCHITECT and OWNER will be based solely upon the schedule's compliance with the contract requirements. By way of the CONTRACTOR assigning activity durations and proposing the sequence of the WORK, the CONTRACTOR agrees to utilize sufficient and necessary management and other resources to perform the WORK in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" Project Schedule.
- C. Submission of a CONTRACTOR's Progress Schedule to the OWNER or ARCHITECT shall not relieve the CONTRACTOR of it's total responsibility for scheduling sequencing and pursuing the WORK to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed WORK.
- D. Monthly Updates and Periodic CPM Schedule Submittals: Following the acceptance of the CONTRACTOR's Initial CPM Construction Schedule, the CONTRACTOR shall monitor the progress of the WORK and adjust the schedule each month to reflect actual progress and any changes in planned future activities. Each schedule update submitted must be complete including all information requested in the original CPM schedule. Each update should continue to show all WORK activities including those already completed. These computer activities should accurately reflect the "As Built" information by indicating when the WORK was actually started and completed.
- E. Neither the submission nor the updating of the CONTRACTOR's original schedule submittal nor the submission, updating, change or revision of any other report, curve, schedule or narrative submitted to the OWNER by the CONTRACTOR under this contract, nor the OWNER's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending, or modifying, in any way, the contract completion date or milestone dates or of modifying or limiting in any way the CONTRACTOR's obligations under this contract. Only a signed, fully executed Change Order can modify these contractual obligations.

1.6 CHANGE ORDERS

A. Upon approval of a Change Order, or upon receipt by the CONTRACTOR of authorization to proceed with additional WORK, the change shall be reflected in the next submittal of the CPM schedule by the CONTRACTOR. The CONTRACTOR shall utilize a sub-network in the schedule depicting the changed WORK and its effect on other activities. This sub-network shall be tied to the main network with the appropriate logic so that a true analysis of the Critical Path can be made.

1.7 CPM SCHEDULE FLOAT

- A. Float Time: Float time shall be as follows:
 - 1. Definition: Unless otherwise provided herein, float as referenced in these documents is total float. Total float is the period of time measured by the number of working days each noncritical path activity may be delayed before it and its succeeding activities become part of the critical path. If a noncritical path activity is delayed beyond its float period, that activity then becomes part of the critical path and controls the end date of the Project. Thus, the delay of a noncritical path activity beyond its float period will cause delay to the Project itself.

2. Float Ownership. Neither the OWNER nor the CONTRACTOR own the float time. The Project owns the float time. As such, liability for delay for the Project completion date rests with the party actually causing delay to the Project completion date. For example, if Party A uses some, but not all of the float time and Party B later uses the remainder of the float time as well as additional time beyond the float time, then Party B shall be liable for the costs associated with the time that represents a delay to the Project's completion data. Party A would not be responsible for any costs since it did not consume all of the float time and additional float time remained, therefore, the Project's completion date was unaffected.

1.8 SCHEDULE REPORTS (FORMAT)

- A. Schedule Reports: Schedule Reports shall be prepared based on the Construction Schedule, and shall include the following minimum data for each activity:
 - 1. Activity Numbers, and Responsibility Codes.
 - 2. Estimated Activity Duration.
 - 3. Activity Description.
 - 4. Activity's Percent Complete.
 - 5. Early Start Date (Calendar Dated).
 - 6. Early Finish Date (Calendar Dated).
 - 7. Late Start Date (Calendar Dated).
 - 8. Late Finish Date (Calendar Dated).
 - 9. Status (Whether Critical).
 - 10. Total Float for Each Activity.
 - 11. Free Float for Each Activity.
 - 12. Cost Value for Each Activity.
- B. Project Information: Each Schedule Report shall be prefaced with the following summary data.
 - 1. Project Name.
 - 2. CONTRACTOR.
 - 3. Type of Tabulation.
 - 4. Project Duration.
 - 5. Contract Completion Date (revised to reflect time extensions).
 - 6. The Commencement Date Stated in the Noticed to Proceed.
 - 7. The Data Date and Plot Date of the Network Diagram.
 - 8. If an update, cite the new schedule completion date.

1.9 PROJECT STATUS REPORTING

- A. In addition to the submittal requirements for the CPM scheduling identified in this Section, the CONTRACTOR shall provide weekly Project status reports (Overview Bar Chart Schedule and a written narrative report). Status reporting shall be in the form specified below.
- B. The CONTRACTOR shall prepare and submit weekly an Overview Bar Chart Schedule of the major Project components. The overview bar chart schedule shall be a summary of the current CPM schedule (original and as updated and adjusted throughout the entire construction period). It shall be limited to one sheet which shall not exceed 11-inch by 17-inch. The major Project components shall be represented as time bars which shall be subdivided into various types of WORK.

- C. The CONTRACTOR shall provide written narrative reports of the status of the Project for submission to the ARCHITECT as noted in paragraph 1.9.(A) of this Section. Written status reports shall include:
 - 1. The status of major Project components (percent complete, amount of time, ahead or behind schedule) and an explanation of how the Project will be brought back on schedule if delays have occurred.
 - 2. The progress made on critical activities indicated on the CPM schedule.
 - 3. Explanations for any lack of WORK on critical path activities planned to be progressed during the last month.
 - 4. Explanations for any schedule changes, including changes to the logic or to activity durations.
 - 5. A list of the critical activities scheduled to be performed in the next two month period.
 - 6. The status of major material and equipment procurement.
 - 7. The value of materials and equipment properly stored at the site but not yet incorporated into the WORK-in-place.
 - 8. Any delays encountered during the reporting period.
 - 9. An assessment of inclement weather delays and impacts to the progress of the WORK.
- D. The CONTRACTOR may include any other information pertinent to the status of the Project. The CONTRACTOR shall include additional status information required by the ARCHITECT.

1.10 INCLEMENT WEATHER PROVISIONS OF THE SCHEDULE

A. If applicable, CONTRACTOR's construction schedule shall include at least 7 lost normal WORK days on the CPM schedule's critical path due to inclement weather. Lost normal WORK days shall be determined as specified in Section 00800 - Supplemental General Conditions.

1.11 LIQUIDATED DAMAGES

A. If any submittal required by this Section is determined by the ARCHITECT to be incomplete or is submitted later than required, the OWNER will suffer financial loss and accordingly liquidated damages will be assessed against the CONTRACTOR in accordance with Article 4 in Section 00500 - Agreement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013211

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 GENERAL

- A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the ARCHITECT.
- B. Prior to the Pre-Construction Conference, the CONTRACTOR shall submit the following items to the ARCHITECT for review:
 - 1. A submittal schedule for Shop Drawings, Samples, Product Data, and proposed Substitutes or "Or-Equal" items.
 - 2. A Schedule of Values.
 - 3. A complete progress schedule for all phases of the Project.
 - 4. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit and the expected date of submittal for the permit and required date for receipt of the permit. CBJ shall apply for the Building Permit.
 - 5. Material Safety Data Sheets on products used on the Project.
 - 6. A traffic maintenance plan, as required.
 - 7. A letter designating the CONTRACTOR's Superintendent, defining that person's responsibility and authority.
 - 8. A letter designating the CONTRACTOR's safety representative and the EEO Officer and that person's responsibility and authority.
- C. No payments shall be made to the CONTRACTOR until the above-listed items are submitted in their entirety, as determined by the ARCHITECT.
- D. The CONTRACTOR shall coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities. Transmit in advance of performance of related activities to avoid delay. Coordinate transmittal of different submittals for related elements so processing will not be delayed by the need to review concurrently for coordination. The ARCHITECT reserves the right to withhold action on a submittal requiring coordination until related submittals are received. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the WORK to permit processing.
- E. The CONTRACTOR shall distribute an electronic copy in PDF format of the Construction Schedule, Schedule of Values, and the Submittal Schedule to the ARCHITECT, Subcontractors, and other parties required to comply with scheduled dates. Post paper copies of the above listed in the temporary field office. When revisions are made, distribute to the same parties and post in the same locations. Revise and update each Schedule after each meeting or activity, where revisions have been made. Issue the updated Schedules concurrently with report of each meeting.

F. DEFINITIONS:

1. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet

SECTION 013300 – SUBMITTAL PROCEDURES

protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

2. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.2 SUBMITTAL PROCESS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by ARCHITECT for CONTRACTOR's use in preparing submittals.
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD 2010
 - c. Contractor has permission to use the digital data files solely for this Project. Any other use of the digital data files without the express written consent of the Architect is prohibited.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on ARCHITECT's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 14 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. ARCHITECT will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 14 days for review of each resubmittal.
 - 4. Sequential Review: Where sequential review of submittals by ARCHITECT's consultants, Owner, or other parties is indicated, allow 14 days for initial review of each submittal.
 - 5. Concurrent Consultant Review: CONTRACTOR may transmit submittals simultaneously to ARCHITECT, Architect of Record and to Architect of Record's consultants when specifically allowed by ARCHITECT. Allow 14 days for review of each submittal. Submittal will be returned to ARCHITECT before being returned to Contractor.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., BRHRR-061000.01). Resubmittals

SECTION 013300 – SUBMITTAL PROCEDURES

shall include an alphabetic suffix after another decimal point (e.g., BRHRR-061000.01.A).

- 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by ARCHITECT.
- 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to ARCHITECT, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Specification Section number and title.
 - g. Drawing number and detail references, as appropriate.
 - h. Location(s) where product is to be installed, as appropriate.
 - i. Related physical samples submitted directly.
 - j. Indication of full or partial submittal.
 - k. Transmittal number or identifier.
 - 1. Submittal and transmittal distribution record.
 - m. Other necessary identification.
 - n. Remarks.
- D. Options: Identify options requiring selection by ARCHITECT.
- E. Deviations: Identify deviations from the Contract Documents on submittals.
- F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from ARCHITECT's action stamp.
- G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.Post electronic submittals as PDF electronic files directly to ARCHITECT's FTP site specifically established for Project. Send e-mail notification to ARCHITECT, Architect of Record, Architect of Record's Consultants and Owner as appropriate.
 - a. ARCHITECT will return annotated file and send e-mail notification to CONTRACTOR. Annotate and retain one copy of file as an electronic Project record document file.
- H. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- I. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification

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and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

- J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- K. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- L. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- M. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- N. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- O. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- P. If submittal is returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN," formal revision and resubmission of said submittal will not be required.
- Q. If submittal is returned to the CONTRACTOR marked "MAKE CORRECTIONS NOTED," formal revision shall be made, and resubmission of said submittal will not be required.
- R. If submittal is returned to the CONTRACTOR marked "AMEND-RESUBMIT," the CONTRACTOR shall revise said submittal and resubmit to the ARCHITECT.
- S. If submittal is returned to the CONTRACTOR marked "REJECTED-RESUBMIT" the CONTRACTOR shall revise said submittal and resubmit to the ARCHITECT.
- T. Fabrication of an item may be commenced only after the ARCHITECT has reviewed the pertinent submittal and returned copies to the CONTRACTOR marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED." Corrections indicated on submittal shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the Contract requirements. Only a change order can alter the contract price, time, or requirements.
- U. All CONTRACTOR submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR, prior to submission to the ARCHITECT. Each submittal shall be dated, signed, and certified by the CONTRACTOR, as being correct and in strict conformance with the Contract Documents. No consideration for review by the ARCHITECT of any CONTRACTOR submittal will be made for any items which have not been so certified by the CONTRACTOR. All non-certified submittals will be returned to the CONTRACTOR without action taken by the

SECTION 013300 – SUBMITTAL PROCEDURES

ARCHITECT, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.

V. The ARCHITECT's review of CONTRACTOR submittals shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions. The CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in CONTRACTOR submittals. The CONTRACTOR shall be responsible for the dimensions and the design of adequate connections and details.

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule shall be submitted electronically in PDF format along with one hard copy. The CONTRACTOR shall coordinate the Submittal Schedule with the list of subcontracts, Schedule of Values and list of products as well as the Construction Schedule. Prepare the Submittal Schedule in chronological order. Identify all submittals required for the completion of the Work. Provide the following information in the Submittal Schedule:
 - 1. Scheduled date for the first submittal.
 - 2. Related Section number.
 - 3. Name of Subcontractor.
 - 4. Description of the construction element covered.
 - 5. Anticipated date of the ARCHITECT's final release or approval.

1.4 SHOP DRAWING SUBMITTALS

- A. Shop Drawings shall be submitted electronically in PDF format. The CONTRACTOR shall submit shop Drawings as required with new information, drawn to accurate scale. Indicate deviations from Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.
- B. The Shop Drawings shall include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Notation of coordination requirements.
 - 4. Notation of dimensions established by field measurement.
 - 5. Shop Drawings shall include bar scale where appropriate.
 - 6. Seal and signature of professional Engineer if specified.
- C. Submit Shop Drawings in the following format:
 - 1. PDF electronic file.
- D. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop Drawings, fabrication, and installation Drawings, section Drawings, lists, graphs, operating instructions, catalog sheets, data sheets, and similar items.
- E. Do not use shop Drawings without a final stamp indicating action taken in connection with construction.

SECTION 013300 – SUBMITTAL PROCEDURES

1.5 SAMPLE SUBMITTALS

- A. Whenever in the Specifications samples are required, the CONTRACTOR shall submit not less than 3 samples of each such item or material to the ARCHITECT for acceptance at no additional cost to the OWNER. Provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
- B. Samples, as required herein, shall be submitted for acceptance a minimum of 14 days prior to ordering such material for delivery to the job site, and shall be submitted in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the WORK.
- C. The CONTRACTOR shall submit full-size samples, cured and finished as specified, and identical to the product proposed. Mount, display, or package samples to facilitate review. Include the following:
 - 1. Generic description.
 - 2. Source.
 - 3. Product name or name of manufacturer.
 - 4. Compliance with recognized standards.
 - 5. Availability and delivery time.
 - 6. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics, and a comparison of these characteristics between the final submittal and the component as delivered and installed. Where variations are inherent in the product, submit multiple units that show limits of the variations.
 - 7. Preliminary Submittals. Where samples are for selection of characteristics from a range of choices, submit a full set of choices for the product. Preliminary submittals will be reviewed and returned indicating selection and other action.
 - 8. Submittals. Except for samples illustrating assembly details, quality of WORK, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken. Maintain a sample set at the Project site, for quality comparisons. Sample sets may be used to obtain final acceptance of the construction associated with each set.
 - 9. Prepare additional sets for Subcontractors, manufacturers, fabricators, installers, and others as required for performance. Show distribution on transmittal forms.
- D. All samples shall be individually and indelibly labeled or tagged, indicating thereon all specified physical characteristics and Supplier's names for identification and submitted to the ARCHITECT for acceptance. Upon receiving acceptance of the ARCHITECT, one set of the samples will be stamped and dated by the ARCHITECT and returned to the CONTRACTOR, and one set of samples will be retained by the ARCHITECT, and one set of samples shall remain at the job site until completion of the WORK.
- E. Unless clearly stated otherwise, it is assumed that all colors and textures of specified items presented in sample submittal are from the manufacturer's standard colors and standard materials, products, or equipment lines. If the samples represent non-standard colors, materials, products or equipment lines, and their selection will require an increase in Contract Time or Price, the CONTRACTOR will clearly indicate this on the transmittal page of the submittal.

1.6 PRODUCT DATA SUBMITTALS

SECTION 013300 - SUBMITTAL PROCEDURES

- A. Product Data Submittal shall be submitted electronically in PDF format. The CONTRACTOR shall collect all the Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copy to indicate the applicable information. Include the following information:
 - 1. Manufacturer's printed recommendations.
 - 2. Compliance with recognized trade association standards.
 - 3. Compliance with recognized testing agency standards.
 - 4. Application of testing agency labels and seals.
 - 5. Notation of dimensions verified by field measurement.
 - 6. Notation of coordination requirements.
 - 7. Preliminary Submittal: Submit a preliminary PDF electronic file copy where selection of options is required.
 - 8. Furnish copies of final submittal to installers, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until an approved copy of Product Data is in the installer's possession. Do not permit use of unmarked copies of Product Data in connection with construction.

1.7 PROPOSED SUBSTITUTE OR "OR EQUAL" ITEM SUBMITTALS

- A. Substitute or "Or Equal" submittals shall be submitted electronically in PDF format. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. If the name is followed by the words "or equal" indicating that a substitution is permitted, materials or equipment of other Suppliers may be accepted by the ARCHITECT if sufficient information is submitted by the CONTRACTOR to allow the ARCHITECT to determine that the material or equipment proposed is equivalent or equal to that named, subject to the following requirements:
 - 1. The burden of proof as to the type, function, and quality of any such substitute material or equipment shall be upon the CONTRACTOR.
 - 2. The ARCHITECT will be the sole judge as to the type, function, and quality of any such substitute material or equipment and the ARCHITECT's decision shall be final.
 - 3. The ARCHITECT may require the CONTRACTOR, to furnish at the CONTRACTOR's expense, additional data about the proposed substitute.
 - 4. The OWNER may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.
 - 5. Acceptance by the ARCHITECT of a substitute item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitute item.
 - 6. The CONTRACTOR shall be responsible for resultant changes and all additional costs which the accepted substitution requires in the CONTRACTOR's WORK, the WORK of its Subcontractors and of other contractors, and shall effect such changes without cost to the OWNER. This shall include the cost for redesign and claims of other contractor(s) affected by the resulting change.
- B. The procedure for review by the ARCHITECT will include the following:

SECTION 013300 – SUBMITTAL PROCEDURES

- 1. If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the ARCHITECT on the "Substitution Request Form" included at the end of this Section for acceptance thereof.
- 2. Unless otherwise provided by law or authorized in writing by the ARCHITECT, the "Substitution Request Form(s)" shall be submitted within the 14-day period after Notice of Award/Notice To Proceed.
- 3. Wherever a proposed substitute material or equipment has not been submitted within said 14-day period, or wherever the submission of a proposed substitute material or equipment has been judged to be unacceptable by the ARCHITECT, the CONTRACTOR shall provide material or equipment named in the Contract Documents.
- 4. The CONTRACTOR shall certify that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified, and be suited to the same use as that specified.
- 5. The ARCHITECT will be allowed a reasonable time within which to evaluate each proposed substitute. In no case will this reasonable time period be less than14 days.
- 6. As applicable, no shop Drawing submittals will be made for a substitute item nor will any substitute item be ordered, installed, or utilized without the ARCHITECT's prior written acceptance of the CONTRACTOR's "Substitution Request Form" which will be evidenced by a Change Order.
- C. The CONTRACTOR's application using the "Substitution Request Form" shall contain the following statements and/or information which shall be considered by the ARCHITECT in evaluating the proposed substitution when one or more of the following conditions are satisfied, as determined by the ARCHITECT; otherwise, requests will be returned without action except to record non-compliance with these requirements.
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 - 3. The request is timely, fully documented, and properly submitted.
 - 4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
 - 5. The specified product or method of construction cannot be provided within the contract time. The request will not be considered if the product or method cannot be provided as a result of the CONTRACTOR's failure to pursue the WORK promptly, or to coordinate activities properly.
 - 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 - 7. A substantial advantage is offered to the OWNER, in terms of cost, time, energy conservation, or other considerations of merit, after deducting off-setting responsibilities the OWNER may be required to bear. Additional responsibilities for the OWNER may include additional compensation to the Architect of Record for redesign and evaluation services, increased cost of other construction by the OWNER, or separate contractors, and similar considerations.
 - 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the CONTRACTOR certifies that the substitution will overcome the incompatibility.
 - 9. The specified product or method of construction cannot be coordinated with other materials, and where the CONTRACTOR certifies that the proposed substitution can be coordinated.
 - 10. The specified product or method of construction cannot provide a warranty required by the contract documents and where the CONTRACTOR certifies that the proposed substitution

SECTION 013300 – SUBMITTAL PROCEDURES

provide the required warranty.

- 11. The evaluation and acceptance of the proposed substitute will not prejudice the CONTRACTOR's achievement of substantial completion on time.
- 12. Available maintenance, repair, and replacement service and its estimated cost will be indicated.
- 13. Whether or not incorporation or use of the substitute in connection with the WORK is subject to payment of any license fee or royalty.
- 14. Itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including cost of redesign and claims of other contractors affected by the resulting change.
- D. The CONTRACTOR's submittal and ARCHITECT's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the contract documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

1.8 SCHEDULE OF VALUES

- A. For Lump Sum Pay Unit contracts, the CONTRACTOR shall submit a Schedule of Values to the ARCHITECT. The Schedule of Values shall be submitted electronically in PDF format with one hard copy. The Schedule of Values shall list the cost breakdown of the Lump Sum Pay Unit contract and shall be coordinated with the construction schedule.
 - 1. Correlate line items in the Schedule of Values with other schedules and forms.
 - 2. Use the Contract Document's Table of Contents as a guide to establish the format for the Schedule of Values.
 - 3. Include Record Drawings as a line item.

1.9 PROGRESS SCHEDULE

- A. Progress Schedule shall be submitted electronically in PDF format with one hard copy. The progress schedule shall be in Bar Chart or Critical Path Method (CPM) form, as required by the ARCHITECT.
- B. The progress schedule shall show the order in which the CONTRACTOR proposes to carry out the WORK and the contemplated date on which the CONTRACTOR and its Subcontractors will start and finish each of the salient features of the WORK, including any scheduled periods of shutdown. The schedule shall also indicate any anticipated periods of multiple-shift work.
- C. Upon substantial changes to the CONTRACTOR's progress schedule of WORK or upon request of the ARCHITECT, the CONTRACTOR shall submit a revised progress schedule(s) in the form required. Such revised schedule(s) shall conform with the Contract Time and take into account delays which may have been encountered in the performance of the WORK. In submitting a revised schedule, the CONTRACTOR shall state specifically the reason for the revision and the adjustments made in the schedule or methods of operation to ensure the completion of all the WORK within the Contract Time.

1.10 RECORD DRAWING SUBMITTAL

SECTION 013300 – SUBMITTAL PROCEDURES

- A. The CONTRACTOR shall keep and maintain, at the job site, one record set of CONTRACT Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Revisions to routing of piping and conduits.
 - d. Revisions to electrical circuitry.
 - e. Actual equipment locations.
 - f. Duct size and routing.
 - g. Locations of concealed internal utilities.
 - h. Changes made by Change Order or Construction or Work Change Directive.
 - i. Changes made following ARCHITECT'S written orders.
 - j. Details not on the original CONTRACT Drawings.
 - k. Field records for variable and concealed conditions.
 - 1. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Said record Drawings shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the WORK as actually constructed.
- C. These master record Drawings of the CONTRACTOR's representation of as-built conditions, including all revisions made necessary by Addenda, Change Orders, and the like shall be maintained up-to-date during the progress of the WORK.
- D. Copies of the record Drawings shall be submitted to the ARCHITECT prior to the Notice of Substantial Completion by the ARCHITECT.

SECTION 013300 - SUBMITTAL PROCEDURES

E. Final payment will not be acted upon until the CONTRACTOR prepared record Drawings have been delivered to the ARCHITECT.

1.11 RECORD SPECIFICATIONS SUBMITTAL

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Copies of the record Specifications shall be submitted to the ARCHITECT prior to the Notice of Substantial Completion by the ARCHITECT.
- C. Final payment will not be acted upon until the CONTRACTOR prepared record Specifications have been delivered to the ARCHITECT.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

(Substitution Request Form – Next Page)

SECTION 013300 - SUBMITTAL PROCEDURES

CBJ Engineering Department SUBSTITUTION REQUEST FORM

ТО:		Proje	ect:
Contract No			
SPECIFIED ITEM:			_
Section	Page	Paragraph	Description

The undersigned requests consideration of the following: **PROPOSED SUBSTITUTION**:

Attached data includes product description, Specifications, Drawings, photographs, performance and test data adequate for evaluation of the request. Applicable portions of the data are clearly identified.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

- 1. The proposed substitution does not affect dimensions shown on Drawings and will not require a change in any of the Contract Documents.
- 2. The undersigned will pay for changes to the design, including engineering design, detailing, and construction costs caused by the requested substitution which is estimated to be \$_____.
- 3. The proposed substitution will have no adverse affect on other contractors, the construction schedule (specifically the date of substantial completion), or specified warranty requirements.
- 4. Maintenance and service parts will be locally available for the proposed substitution.
- 5. The incorporation or use of the substitute in connection with the WORK is not subject to payment of any license fee or royalty.

The undersigned further states that the function, appearance, and quality of the Proposed Substitution are equivalent or superior to the specified item.

Submitted by CONTRACTOR (date):	ARCHITECT Review (date):
Signature:	By:
Print Name:	Decision by CBJ:
Firm:	AcceptedAccepted as Noted
Title:	Not AcceptedReceived Too Late
Telephone:	
Attachments:	Signature:

The use of this substitution is not authorized until accepted by the ARCHITECT.

END OF SECTION 013300

SECTION 014000 - QUALITY CONTROL

PART 1 - GENERAL

1.1 DEFINITION

A. Specific quality control requirements for the WORK are indicated throughout the Contract Documents. The requirements of this Section are primarily related to performance of the WORK beyond furnishing of manufactured products. The term "Quality Control" includes inspection, sampling and testing, and associated requirements.

1.2 INSPECTION AT PLACE OF MANUFACTURE

- A. Unless otherwise indicated, all products, materials, and equipment shall be subject to inspection by the ARCHITECT at the place of manufacture.
- B. The presence of the ARCHITECT at the place of manufacturer, however, shall not relieve the CONTRACTOR of the responsibility for furnishing products, materials, and equipment which comply with all requirements of the Contract Documents. Compliance is a duty of the CONTRACTOR, and said duty shall not be avoided by any act or omission on the part of the ARCHITECT.

1.3 SAMPLING AND TESTING

- A. Unless otherwise indicated, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, ATM, and AASHTO as applicable to the class and nature of the article or materials considered; however, the OWNER reserves the right to use any generally-accepted system of sampling and testing which, in the opinion of the ARCHITECT will insure the OWNER that the quality of the WORK is in full accord with the Contract Documents.
- B. Any waiver by the OWNER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial WORK, shall not be construed as a waiver of any requirements of the Contract Documents.
- C. Notwithstanding the existence of such waiver, the ARCHITECT reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents, shall be reasonable cause for the ARCHITECT to require the removal or correction and reconstruction of any such WORK in accordance with the General Conditions.

SECTION 014000 - QUALITY CONTROL

1.4 INSPECTION AND TESTING LABORATORY SERVICE

- A. Inspection and testing laboratory service shall comply with the following:
 - 1. The OWNER will appoint, employ, and pay for services of an independent firm to perform inspection and testing or will perform inspection and testing itself.
 - 2. The ARCHITECT will perform inspections as specified in individual Specification sections.
 - 3. Reports will be submitted by the independent firm to the ARCHITECT in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 4. The CONTRACTOR shall cooperate with the ARCHITECT or independent firm and furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - 5. The CONTRACTOR shall notify ARCHITECT 24-hours prior to the expected time for operations requiring inspection and laboratory testing services.
 - 6. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the ARCHITECT. The CONTRACTOR shall bear all costs from such re-testing at no additional cost to the OWNER.
 - 7. For samples and tests required for CONTRACTOR's use, the CONTRACTOR shall make arrangements with an independent firm for payment and scheduling of testing. The cost of sampling and testing for the CONTRACTOR's use shall be included in the Contract Price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Inspection: The CONTRACTOR shall inspect materials or equipment upon the arrival on the job site and immediately prior to installation, and reject damaged and defective items.
- B. Measurements: The CONTRACTOR shall verify measurements and dimensions of the WORK, as an integral step of starting each installation.
- C. Manufacturer's Instructions: Where installations include manufactured products, the CONTRACTOR shall comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in Contract Documents.

END OF SECTION 014000

SECTION 014210 - REFERENCE STANDARDS & DEFINITIONS

PART 1 - GENERAL

1.1 GENERAL

- A. Titles of Sections and Paragraphs: Captions accompanying Specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. Applicable Publications: Whenever in these Specifications references are made to published Specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest Specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. Specialists, Assignments: In certain instances, Specification text requires (or implies) that specific WORK is to be assigned to specialists or expert entities, who must be engaged for the performance of that WORK. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of WORK is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

1.2 ABBREVIATIONS AND NAMES

A. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision.

1.3 PERMITS, LICENSES, AND CERTIFICATES

A. Upon request by the ARCHITECT, the CONTRACTOR shall submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing on performance of the WORK.

1.4 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all WORK specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.

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- B. References herein to "Building Code" or "International Building Code" shall mean International Building Code of the International Conference of Building Officials (ICBO).
- C. Similarly, references to "Mechanical Code" or "International Mechanical Code," "Plumbing Code" or "International Plumbing Code," "Fire Code" or "International Fire Code," shall mean International Mechanical Code, International Plumbing Code and International Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.
- D. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ARCHITECT for clarification and directions prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.
- E. The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and Specifications listed herein.
- F. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.5 DEFINITIONS

A. The basic contract definitions are included in Section 00700 - General Conditions. The following definitions have the meaning defined in the Technical Portions of the WORK:

Approve - Used in conjunction with action on submittals, applications, and requests, is limited to the ARCHITECT's duties and responsibilities as stated in the Conditions of the Contract.

Directed - Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the ARCHITECT," "requested by the ARCHITECT", and similar phrases.

Experienced - Means having a minimum of five previous Projects similar in size to this Project, and being familiar with precautions required and with requirements of the authority having jurisdiction.

Furnish - means to supply and deliver to the site, to unload and unpack ready for assembly, installation, testing, and start-up.

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Indicated - is a word used to direct the CONTRACTOR to information contained on the drawings or in the Specifications. Terms such as "shown," "noted," "scheduled," and "specified" also may be used to assist in locating information but no limitation of location is implied or intended.

Install - defines operations at the site including assembly, erection, placing, anchoring, applying, shaping to dimension, finishing, curing, protecting, and cleaning, ready for the OWNER's use.

Installer - A CONTRACTOR or an entity engaged by the CONTRACTOR, as an employee or Subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

Project Site - The space available for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

Provide - is defined as furnish and install, ready for the intended use.

Regulation - Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the WORK.

Testing Laboratories - An independent entity engaged to perform specific inspections or tests at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

BRH ROOF REPLACEMENT

CBJ Contract No. E11-286

SECTION 014250 - ACRONYMS OF INSTITUTIONS

PART 1 - GENERAL

1.1 GENERAL

A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.2 ACRONYMS

SECTION 014250 - ACRONYMS OF INSTITUTIONS

CEMA	Conveyors Equipment Manufacturer's Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DCDMA	Diamond Core Drill Manufacturer's Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
FPL	Forest Products Laboratory
HI	Hydronics Institute
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
IOS	International Organization for Standardization
IP IDC	Institute of Petroleum (London) Institute of Printed Circuits
IPC IPCEA	
IPCEA ISA	Insulated Power Cable Engineers Association
ISA ITE	Instrument Society of America
MBMA	Institute of Traffic Engineers
MPTA	Metal Building Manufacturer's Association Mechanical Power Transmission Association
MFIA MTI	
NAAMM	Marine Testing Institute National Association of Architectural Metal Manufacturer's
NACE	
NACE	National Association of Corrosion Engineers National Bureau of Standards
NCCLS	
NEC	National Committee for Clinical Laboratory Standards National Electrical Code
NEC	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NLGI	National Lubricating Grease Institute
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
RIS	Redwood Inspection Service
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendation
SSA	Swedish Standards Association
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
UBC	Uniform Building Code
UMC	Uniform Mechanical Code
0.000	

SECTION 014250 - ACRONYMS OF INSTITUTIONS

UPC	Uniform Plumbing Code
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014250

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections:
 - 1. Section 011000 Summary for work restrictions and interruptions.
 - 2. Section 015000 Temporary Utilities.
 - 3. Section 015221 Special Safety Requirements (ICRA).

1.3 JOB CONDITIONS

A. Scheduled Uses. The CONTRACTOR shall, in conjunction with establishment of the job progress schedule, establish a schedule for implementation and termination of service for each temporary utility or facility, at the earliest feasible time, and when acceptable to the OWNER and the ARCHITECT, change over from use of temporary utility service to permanent service

1.4 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to OWNER'S construction forces, ARCHITECT, Architect of Record and subconsultants, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from OWNER'S existing water system is available for use without metering and without payment of use charges, as long as CONTRACTOR demonstrates responsible use, coordinates closely with OWNER, and uses conservation measures. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from OWNER'S existing system is available for use without metering and without payment of use charges, as long as CONTRACTOR demonstrates responsible use, coordinates closely with OWNER, and uses conservation measures. Provide connections and extensions of services as required for construction operations.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable codes, regulations, and OWNER'S operational needs to maintain building access and egress throughout the WORK.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before OWNER'S acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The CONTRACTOR shall provide either new or used materials and equipment, which are in substantially undamaged condition and without significant deterioration and which are recognized in the construction industry, by compliance with appropriate standards, as being suitable for intended use in each case. Where a portion of temporary utility is provided for CONTRACTOR by utility company, the CONTRACTOR shall provide remainder with matching and compatible materials and equipment and comply with recommendations of utility company.
- B. Portable Chain-Link Fencing: Minimum 2-inch galvanized steel, chain-link fabric fencing; with galvanized steel pipe posts with concrete bases for supporting posts, or as directed by the Owner to maintain security.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.
- D. Existing and Finished Materials Protection: Provide minimum 3/4" plywood or OSB with framing as required, over existing materials, as required to protect from temporary use until final acceptance by the OWNER.
 - 1. Special care is to be taken around existing walkways and windows near and/adjacent to; Temporary Construction Stair to Roof; and Construction Waste; indicated on sheet A-003.
 - 2. All wood used shall be fire retardant.

2.2 TEMPORARY FACILITIES

- A. Contractor shall provide Field Office space for their own use with sufficient space for occasional use by the OWNER or ARCHITECT.
- B. Field Offices, General: Prefabricated or mobile units with serviceable finishes, windows, temperature controls, and foundations adequate for normal loading, of sufficient size to accommodate needs of CONTACTOR, OWNER, ARCHITECT, and construction personnel office activities and to accommodate project meetings specified in other Division 1 Sections, with office space as follows:
 - 1. Heating equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 2. Lighting fixtures capable of maintaining average illumination of 40 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Sheds to have lighting of 20 fc at 36" AFF min.; GFI power and temporary circuits, etc.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control as approved by the OWNER for use in areas of the WORK that have systems interrupted.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 3. Permanent HVAC System: Clean permanent HVAC systems that are used by the Contractor during the Work as required in Division 1 Section "Closeout Procedures".

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Obtain approval of temporary facilities locations by the OWNER and locate where they will serve Project adequately and result in minimum interference with performance of the WORK. Relocate and modify facilities as required by progress of the WORK.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY INSTALLATION

- A. Heating and Ventilation: Provide temporary heating and ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- B. Temporary Enclosure: At contractors option
- C. Isolation of WORK Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
 - 2. Perform daily construction cleanup and final cleanup using approved, HEPA-filterequipped vacuum equipment.
- D. Ventilation and Humidity Control: Provide temporary conditioning and ventilation equipment to provide a negative air pressure during entire duration of construction WORK. This equipment shall meet the required construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary facilities located within construction area to maintain hospital operations. Comply with NFPA 241.
 - 2. Maintain support facilities until OWNER schedules Substantial Completion inspection. Remove before Substantial Completion.
- B. Parking: Use areas designated by OWNER for construction personnel parking.
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Temporary Signs: Provide signs as required to inform public and individuals seeking entrance to Project and temporary, directional signs for public access and use of affected hospital areas.
 - 2. Maintain and touchup signs so they are legible at all times.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations Comply with requirements of authorities having jurisdiction. Contractor is encouraged to recycle materials accepted at the Juneau waste recycling center, and to offer scrap materials to the public for no cost to minimize waste to the land fill.

- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- F. Existing Elevator Use: Use of OWNER'S existing elevator will limited and use granted only on a limited basis, upon written approval; which must be requested for each use with a minimum 72 hr notification prior to need.
 - 1. Do not load elevator beyond their rated weight capacity.
 - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- G. Temporary Construction Stairs to Roof (OSHA Compliant): Access to the roof of Hospital for all WORK, will be provided by contractor designed; temporary construction stair to roof, self supporting, prefabricated metal stairway system, with cover and painted lockable security enclosure to 8'. Location as indicated on the construction documents A003; for duration of construction WORK; for access of workers, materials and equipment.
 - 1. Submit necessary documentation to ARCHITECT prior to installation for review and acceptance.
 - a. Submit plans, elevation and details.
 - b. Design to include Engineers signature and seal, for seismic considerations.
 - c. Provide keys for access by Hospital Security.
- H. Existing Stair Usage: Use of OWNER'S existing stairs will limited and use granted only on a limited basis, upon written approval; which must be requested for each use with a minimum 72 hr notification prior to need; provided stairs are cleaned and maintained in a condition acceptable to OWNER. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.4 TEMPORARY SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to authorities having jurisdiction.

- A. Provide measures to prevent airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- B. Provide temporary enclosures for protection of construction and workers from inclement weather and for containment of heat at CONTRACTOR option.
- C. Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- F. Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
- G. Install and maintain temporary fire-protection facilities. Comply with NFPA 241.
- H. Wall and Window Protection: Install protection continuously between exterior finished grade (concrete sidewalks) to top of copping and WORK areas as required to protect existing walls and windows from damage due to construction operations and traffic. Locate protection as directed by the ARCHITECT. Replace protection that is damaged or no longer functional.
- I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. PROHIBIT SMOKING ON HOSPITAL GROUNDS AND CONSTRUCTION AREAS.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL

A. Moisture-Protection During WORK: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired. Repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION 015000

PART 1 - GENERAL

1.1 GENERAL

- A. Mobilization shall include obtaining all permits; moving all plant and equipment onto the site; furnishing and erecting plants, temporary buildings, and other construction facilities; implementing security requirements, all as required for the proper performance and completion of the WORK. Mobilization shall include the following principal items:
 - 1. Moving all the CONTRACTOR's plant and equipment required for operations onto the site.
 - 2. Providing all on-site communication facilities, including radios and cellular phones.
 - 3. Providing on-site sanitary facilities.
 - 4. Obtaining all required permits.
 - 5. Having all OSHA required notices and establishment of safety programs.
 - 6. Having the CONTRACTOR's superintendent at the jobsite full time.
 - 7. Submitting initial submittals.
 - 8. Arranging for, and erection of, CONTRACTOR's work and storage yard.
 - Installation of CBJ Project sign, if applicable, in accordance with CBJ Standard Detail 127A

 Project Sign Display. Sign board and sign graphics will be provided by the OWNER. All
 other materials and installation shall be provided by the CONTRACTOR.

1.2 PAYMENT FOR MOBILIZATION

- A. The CONTRACTOR's attention is directed to the condition that no payment for Mobilization, or any part thereof, will be approved for payment under the Contract until all Mobilization items listed above have been completed as specified.
- B. As soon as practicable, after receipt of Notice to Proceed, the CONTRACTOR shall submit a breakdown showing the estimated value of each major component of Mobilization to the ARCHITECT for approval. When approved by the ARCHITECT, the breakdown will be the basis for initial progress payments in which Mobilization is included.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015005

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The types of utility services required for general temporary use at the Project site shall be coordinated with section 150000 Temporary Facilities and Controls.

1.2 JOB CONDITIONS

- A. Utilities. In general, water, sewer, and electrical services shall be provided without cost to the CONTRACTOR. In doing so the ARCHITECT expects the CONTRACTOR to make prudent use of such facilities and not to act in any manner that would escalate utility costs above a level that would be anticipated for such activities. Should ARCHITECT determine that CONTRACTOR fails to make prudent use of utilities, and following efforts to resolve such improper use, ARCHITECT may assess the costs associated with such improper use to the CONTRACTOR.
- B. Scheduled Uses. The CONTRACTOR shall, in conjunction with establishment of the job progress schedule, establish a schedule for implementation and termination of service for each temporary utility or facility, at the earliest feasible time, and when acceptable to the OWNER and the ARCHITECT.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The CONTRACTOR shall provide either new or used materials and equipment, which are in substantially undamaged condition and without significant deterioration and which are recognized in the construction industry, by compliance with appropriate standards, as being suitable for intended use in each case. Where a portion of temporary utility is provided for CONTRACTOR by utility company, the CONTRACTOR shall provide remainder with matching and compatible materials and equipment and comply with recommendations of utility company.

PART 3 - EXECUTION

3.4 INSTALLATION OF TEMPORARY UTILITY SERVICES

- A CONTRACTOR to make connections for Temporary Utilities for Field Offices and Sheds, to OWNER provided utility pedestal in Staging Area, which has the following utilities available.
 - 1. Power AEL&P.
 - 2. Water.
 - 3. Waste.

- 4. Phone ACS.
- 5. Internet GCI.
- B General. If connection is required to be made to utility company service, the CONTRACTOR shall engage the utility company to install temporary service to Project; and maintain temporary services as installed for required period of use; and relocate, modify or extend as necessary from time to time during that period as required to accommodate total Project construction WORK.
- C Approval of Electrical Connections. All temporary connections for electricity shall be subject to approval of the ARCHITECT and the power company representative, and shall be removed in like manner at the CONTRACTOR's expense prior to final acceptance of the WORK.
- D Separation of Circuits. Unless otherwise permitted by the ARCHITECT, circuits separate from lighting circuits shall be used for all power purposes.
- E Construction Wiring. All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of Subpart K of the OSHA Safety and Health Standards for Construction.

3.5 INSTALLATION OF POWER DISTRIBUTION SYSTEM

- A. Power. The CONTRACTOR shall provide all necessary power required for its operations under the contract, and shall provide and maintain all temporary power lines required to perform the WORK in a safe and satisfactory manner.
- B. Temporary Power Distribution. The CONTRACTOR shall provide a weatherproof, grounded, temporary power distribution system sufficient to accommodate performance of entire WORK of Project, including, but not necessarily limited to, temporary electrical heating where indicated, operation of test equipment and test operation of building equipment and systems which cannot be delayed until permanent power connections are operable, temporary operation of other temporary facilities, including permanent equipment and systems which must be placed in operation prior to use of permanent power connections and power for temporary operation of existing facilities. Provide circuits of adequate size and proper power characteristics for each use; run circuit wiring generally overhead, and rise vertically in locations where it will be least exposed to possible damage from construction operations, and result in least interference with performance of the WORK; provide rigid steel conduit or equivalent raceways for wiring which must be exposed on grade, decks, or other recognized exposures to damage or abuse.

3.3 INSTALLATION OF LIGHTING

- A. Construction Lighting. All WORK conducted at night or under conditions of deficient daylight shall be suitably lighted to insure proper WORK and to afford adequate facilities for inspection and safe working conditions.
- B. Temporary Lighting. The CONTRACTOR shall provide a general, weatherproof, grounded temporary lighting system in every area of construction WORK, as required; and provide sufficient illumination for safe WORK and traffic conditions; and provide shielding as requied for direction illumination so as not to interfere with patient rooms.

3.4 WATER SUPPLY

- A. General. The CONTRACTOR shall coordinate with the ARCHITECT and Using Agency for obtaining water service. CONTRACTOR shall provide all facilities necessary to convey the water from the source to points of use in accordance with the requirements of the Contract Documents.
- B. The CONTRACTOR shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.
- C. Water Connections. The CONTRACTOR shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining the ARCHITECT's permission and that of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the CONTRACTOR shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the said authority, of a size and type acceptable to said authority and agency. The CONTRACTOR shall pay all permit and water connection charges.

3.5 INSTALLATION OF SANITARY FACILITIES

- A. Toilet Facilities. Portable chemical toilets shall be provided wherever needed for the use of CONTRACTOR's employees. Toilets at construction job site shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes. The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wastes from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the ARCHITECT and in accordance with all laws and regulations pertaining thereto.

3.6 FIRE PROTECTION

- A. Fire Protection. The construction plant and all other parts of the WORK shall be connected with the CONTRACTOR's water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the WORK, and responsible persons shall be designated and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The CONTRACTOR's fire protection program shall conform to the requirements of the OSHA Standards for Construction.
- B. Campus Wide Fire Protection: CONTRACTOR shall ensure that existing fire protection systems elsewhere on the hospital campus remain in service at all times and are not affected by the WORK of the CONTRACTOR, Subcontractors, Suppliers or others involved with the Project.

3.7 INSTALLATION OF COMMUNICATIONS

- A. Telephone Services. The CONTRACTOR shall provide and maintain at all times during the progress of the WORK not less than one telephone in good working order, at its own field construction office, at or near the site of the WORK included in the contract. Each such telephone shall be connected to an established exchange for toll service and with all other telephones utilized by the CONTRACTOR.
- B. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
- C. Cellular Phone: CONTRACTOR shall provide a cellular phone for its Project superintendent and require such phone to be available to all Subcontractors, Suppliers and other installers performing WORK at the site. Such phone shall be activated during hours of construction and workers shall respond to any call from the ARCHITECT, Using Agency or governing authority without delay.
- D. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail and web use, in common-use facilities.

3.8 OPERATIONS AND TERMINATIONS

- A. Inspections. Prior to placing temporary utility services into use, and in addition to notifying the ARCHITECT, the CONTRACTOR shall inspect and test each service and arrange for governing authorities' required inspection and tests, and obtain required certifications and permits for use thereof.
- B. Termination and Removal. When need for a temporary utility service or a substantial portion thereof has ended, or not later than time of substantial completion, the CONTRACTOR shall promptly remove installation unless requested by ARCHITECT to retain it for a longer period.
- C. Removal of Water Connections. Before final acceptance of the WORK on the Project, all temporary connections and piping installed by the CONTRACTOR shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the ARCHITECT and to the agency owning the affected utility.

END OF SECTION 015010

PART 1 – GENERAL

1.1 SECURITY PROGRAM

A. The CONTRACTOR shall:

- 1. Protect WORK, existing premises, and Using Agency's operations from theft, vandalism, and unauthorized entry.
- 2. Initiate program in coordination with Using Agency's existing security program at initialization of Project mobilization.
- 3. Maintain program throughout construction period until Final Completion.

1.2 ENTRY CONTROL

- A. The CONTRACTOR shall:
 - 1. Restrict entry of persons and vehicles into Project site, as appropriate.
 - 2. Allow entry only to authorized persons with proper identification.
 - 3. Maintain log of visitors and make log available to ARCHITECT on request.

1.3 PERSONNEL IDENTIFICATION

- A. At the discretion of the ARCHITECT, the CONTRACTOR shall:
 - 1. Require each person authorized to enter premises to possess and visibly display an identification card.
 - 2. Maintain a list of authorized persons and assigned card number. Submit copy to ARCHITECT on request. Individuals not visibly displaying an identification card shall be denied access to the Project. Cost of lost or replacement cards, after the first replacement, shall be charged to CONTRACTOR.
 - 3. Remove "on site" workers without proper identification from the Project site when required by the ARCHITECT.
 - 4. Require return of cards from all individuals when they are no longer involved with WORK at the Project site.
- B. Identification cards shall be provided by the Using Agency and will include personal photograph; name, title and employer, and assigned number. Identification cards will be issued only after each individual has completed a special training program administered by Bartlett Regional Hospital. The program is anticipated to take less than one hour, but is mandatory.

1.4 SECURITY SERVICE

A. If CONTRACTOR chooses not to utilize existing BRH Security forces, then CONTRACTOR shall employ uniformed guard service to provide surveillance of site during all non-working hours.

1.5 RESTRICTIONS

- A. The CONTRACTOR shall not allow cameras on Project site or photographs taken except by written Approval of ARCHITECT.
- B. All personnel employed on the Project site by the CONTRACTOR, Subcontractors, Suppliers, installers and other entities engaged in WORK shall strictly adhere to the security, safety, confidentiality, and hospital compliance program requirements depicted in Section 015221 Special Safety Requirements (ICRA).
- C. ARCHITECT reserves the right to monitor CONTRACTOR's workforce utilizing both audio and visual technology.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015220

PART 1 – GENERAL

1.1 SAFETY PROGRAM

- A. General:
 - 1. The safety of bidders, the CONTRACTOR, their work forces in total, the Using Agency's personnel, patients and the public is a major concern of the ARCHITECT. To ensure Project and campus-wide safety, the CONTRACTOR shall carefully adhere to the requirements of this Section.
 - 2. CONTRACTOR shall employ a safety program to ensure that CONTRACTOR's personnel and all personnel of the Subcontractors, Suppliers, Installers and material workers are trained and kept abreast of hospital safety requirements. In addition to the safety requirements enforced by code or jurisdictional entities, the CONTRACTOR's safety program shall also address fire safety and deployment plans for the Project site, response to accidental release of hazardous materials, breach of infection containment barriers, and general emergency response.
 - 3. CONTRACTOR's safety program will be provided to the ARCHITECT, in writing, prior to commencement of WORK. Plans shall be periodically revised in response to issues that may arise during the course of construction. Such revisions shall be provided promptly to the ARCHITECT.
- B. The CONTRACTOR shall:
 - 1. Abide by all applicable safety practices and requirements, irrespective of their origins.
 - 2. Attend safety related meetings as periodically required by the ARCHITECT.
 - 3. CONTRACTOR shall employ a safety program to ensure that CONTRACTOR's personnel and all personnel of the Subcontractors, Suppliers, Installers and material workers are trained and kept abreast of hospital safety requirements. Maintain program throughout construction period until Final Completion.

1.2 SAFETY STANDARDS

- A. Applicable safety related standards promulgated by safety or code enforcement agencies, such as but not limited to: AK-DEC, OSHA, Building Officials and Fire Marshal's Office representatives.
- B. Safety guidelines and policies established by the Department of Infection Control/Safety/Facilities of Bartlett Regional Hospital covering Infection Control for Construction and Renovation. (See BRH Policy at the end of this section.)
- C. Safety guidelines and policies established by Bartlett Regional Hospital covering Interim Life Safety Plan. (See BRH Policy at the end of this section.)
- D. Safety requirements required by the Contract Documents.

1.3 SAFETY PROCEDURES

- A. In addition to devices required by enforcement entities, the CONTRACTOR shall employ safety and containment devices (barricades, temporary separation/isolation walls, etc.) and warning signs at all locations where the public, patients or hospital staff may have access to, or mistakenly venture into, an area of active construction. The ARCHITECT will have the final determination as to the locations and the extent of the required safety and containment devices and signage.
- B. As determined by the ARCHITECT, and where conditions necessitate the construction of temporary exit routes, the CONTRACTOR shall construct such routes to the standards of the Contract Documents, or the enforcement agency. Such routes shall be Approved by the ARCHITECT prior to putting them into use.
- C. CONTRACTOR shall cooperate with and assist the Using Agency in the establishment and maintenance of "user oriented" directional signage. CONTRACTOR shall not remove, block, or otherwise obscure such directional signage without specific written direction by the ARCHITECT. Signage that has been disrupted during the course of construction shall be immediately repaired or replaced by the CONTRACTOR.
- D. When Directed by the ARCHITECT, CONTRACTOR shall provide fire watch and other fire/life safety personnel on the Project.

1.4 SECURITY SERVICE

- A. The CONTRACTOR shall:
 - 1. Provide all security personnel and programs as described in Specification Section 015220, Security.
 - 2. Cooperate with the ARCHITECT, Using Agency and security forces employed by the Using Agency in ensuring the security and safety of the Project, and all other facilities on the hospital campus.
 - 3. Be advised that the ARCHITECT may observe safety practices via audio and video means.

1.5 RESTRICTIONS WITHIN ACTIVE CONSTRUCTION AREAS

- A. The CONTRACTOR shall restrict entry of persons and vehicles into the active construction areas as appropriate. Allow entry only to authorized persons with proper identification.
- B. Provide immediate notification to the ARCHITECT, Using Agency and security forces employed by the Using Agency of entry, or desired entry, into the active construction areas of any individual not properly authorized.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Bartlett Regional Hospital

Title: INFECTION CONTROL FOR CONSTRUCTION AND RENOVATION

Department: Infection Control/Safety/Facilities

Original Date: 07-02

Author: Jan Beauchamp

PURPOSE:

To establish a process for the identification and reduction of risk from airborne transmission of infectious agents during construction, demolition, renovation, and repair on the Bartlett Regional Hospital Campus.

DEFINITIONS:

- A. **ICRA:** Infection Control Risk Assessment. Analysis of a construction, demolition, or renovation project to establish infection risk and control by a multidisciplinary group designated for that purpose.
- B. **Infection Control Permit:** A permit issued by Infection Control for construction and renovation projects that are Class III or above as determined by the Infection Control Risk Group Matrix. (in the Infection Control Risk Assessment Packet, Appendix C)
- C. **ICRAC:** Infection Control Risk Assessment Committee. An ad hoc subcommittee of the BRH Infection Control Committee tasked with development, oversight, and enforcement of this policy.
- D. HEPA Filter: High efficiency particulate air filters. (99% of 0.3-micron size particles)
- E. HVAC: Heating, Ventilation, Air-conditioning. (Air-handling unit.)
- F. CRP: Construction and Renovation Policy. (This policy.)

POLICY:

- A. An Infection Control Risk Assessment (ICRA) will be performed for every construction, demolition, and renovation project on the BRH campus, including site work (utilities, landscaping, etc) even when no building is being constructed or renovated.
- B. Bartlett Regional Hospital requires any subcontractor, sub-subcontractor, vendor, employee, or agent to be bound by these requirements. Before any demolition or construction on-site begins, the contractor and contractor's employees will attend mandatory training sessions provided by a Bartlett Regional Hospital Safety or Infection Control representative. Course objectives will be distributed at class.
- C. An Infection Control Permit (see the Infection Control Risk Assessment Packet Appendix C) will be issued by the ICRAC and posted at the work-site as appropriate for the duration of the project, as indicated by the ICRA.
- D. Infection Control and Safety inspections are the responsibility of the ICRAC.
- E. Changes to the ICRA may be made by the ICRAC at any time during the project. Changes will be communicated to the Construction Manager or designee.

- F. Bartlett Regional Hospital's Safety Officer or the ICRAC may modify performance requirements for certain activities. A modification made by BRH personnel does not relieve the contractor of compliance with proper infection control procedures.
- G. When required by the Infection Control Permit, HEPA equipped filtration machines shall provide air flow into construction area not less than 100 FPM at barricade entrances with doors fully open. HEPA equipped air filtration machines shall be connected to normal power and ganged to a single switch for emergency shutoff and shall run continuously. In the event of a power failure and no back-up power is immediately available, work will be stopped until power becomes available.
- H. Documentation of the ICRA process will be maintained by the Construction Manager or designee.
- I. Regular reports will be provided to the Infection Control Committee by a representative of the ICRAC.

PROCEDURES:

A. Responsibilities During Project Planning

- A.1. An interdisciplinary team including architects, construction managers, contractors, department personnel, the Infection Control Coordinator, and Safety Officer will evaluate any construction project from design through completion for infection control concerns.
- A.2. The Infection Control Coordinator will be involved in the design phase of any project. The design and function considerations for infection control are listed in Appendix A. These considerations are for the duration of the project, as well as considerations for the infection control issues for the finished project. The Construction Manager or designee will contact the Infection Control Coordinator for obtaining input on the project.
- A.3. Each project will have an Infection Control Risk Assessment (ICRA) performed during the planning phase of the project. Projects in Class III, III/IV, or IV require an Infection Control Permit to be posted at the site for the duration of the project. (Appendix C)
- A.4. Construction measures required by the ICRA will be communicated to the contractors by the Construction Manager or designee during the bidding phase of the project. All contractors and contract construction personnel be responsible for maintaining and complying with the general and class specific infection control and safety practices for the project.

B. Responsibilities During the Active Construction Phase

- B.1. The Construction Manager or designee will perform a Safety and Infection Control Risk Assessment for every day that there is work on the site (Appendix B). Unsafe conditions will be corrected immediately and corrections documented on the form. The Construction Manager or designee is responsible for oversight and documentation of this process.
- B.2. As a quality control measure, a member of the ICRAC will inspect each project of Class III or greater on a weekly basis, using the BRH Safety and Infection Control Risk Assessment form. (Appendix C) The Construction Manager or designee will be notified immediately to correct any unsafe conditions.
- B.3. The contractor shall be required to take immediate action to correct all deficiencies.
- B.4. The ICRAC has the authority to stop construction for any breach in the infection control practices, or for any patient safety concern related to infection and construction. This will be done through the Construction Manager or designee.
- B.5. Failure of the contractor to promptly correct such deficiencies will result in corrective action taken by CBJ and BRH Construction Management per project documents.

B.6. The Contractor will notify the Construction Manager or designee for any assistance with medical waste, work in negative pressure areas, or any concerns involving patients or patient care areas.

C. General Infection Control Practices for All Construction and Renovation Projects

- C.1. Construction activities causing disturbance of existing dust, or creating new dust, must be conducted in tight enclosures cutting off any flow of particles into patient areas.
- C.2. Construction areas will have dust mops, wet mops, brooms, buckets, and clean rags for wiping fine dust from floors and surfaces in adjacent areas.
- C.3. Walk-off mats shall be used outside of every construction entrance. Any dust outside the barrier shall be cleaned up immediately using a HEPA-filtered vacuum or wet mop.
- C.4. Debris from the construction site will be removed with carts that are covered in a manner that does not allow the escape of dust.
- C.5. Any ceiling tiles that are moved (even for visualization) outside of the construction barrier will be replaced immediately when unattended.
- C.6. Barriers

C.6.1. Closed door with masking tape applied over the frame and door is acceptable for projects that can be contained within a single room.

C.6.2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected:

C.6.2.1. Small, short duration projects generating minimal dust may use fire-rated plastic sheeting that extends from floor to ceiling. Seams must be sealed with tape to prevent dust and debris from escaping and have at least 2-foot overlapping flaps for access to entry.

C.6.2.2. Any project generating moderate to high levels of dust or of more than short duration must require rigid dust-proof, and fire-rated barrier walls (e.g. drywall) with caulked seams. An interim plastic dust barrier may be required to protect the area while the rigid impervious barrier is being constructed.

C.6.2.3. Barriers are required at penetrations of ceiling envelopes, chases and ceiling spaces to stop movement of air and debris.

C.6.2.4. Large dusty projects require an anteroom or double entrance vestibule for workers to remove protective clothing or vacuum off existing clothing.

C.7. HEPA-filtered negative pressure units will be run continually during the course of the project (24 hours per day).

D. Performing An Infection Control Risk Assessment

- D.1. Each project will have an Infection Control Risk Assessment done during the programming phase of the project. The results will be communicated with the architect and contractor. (See ICRA Packet, Appendix C).
- D.2. Class III and higher projects require an Infection Control Permit before construction begins. (ICRA Packet, Appendix C)

REFERENCES:

Bartley, J., ed. (1999). <u>APIC Infection Control Toolkit Series: Construction and Renovation</u>. Washington, DC: Association for Professionals in Infection Control and Epidemiology, Inc.

Centers for Disease Control and Prevention, Healthcare Infection Control Practices Advisory Committee. (2001). <u>Draft Guideline for Environmental Infection Control in Healthcare Facilities</u>.

Comprehensive Manual on Accreditation of Hospitals (2001). Oakbrook, IL.: Joint Commission on Accreditation of Hospitals and Healthcare Organizations: 2001.

Davis, S. (2001). "Don't Wait for Dust to Settle on Patient Risk." In <u>Environment of Care Leader (6)</u> 11. (May 21, 2001).

Approval/Review/Revision					
Date:	Signature:	Date:	Signature:	Date:	Signature:

APPENDIX A:

Construction Design and Function Considerations for Environmental Infection Control

- A. Location of sinks and handwashing product dispensers.
- B. Types of faucets (aerated vs. non-aerated, and type of faucet e.g. wrist blades, knee, foot, or infrared controlled).
- C. Air-handling systems engineered for optimal performance and easy maintenance and repair.
- D. Air changes per hour (ACH) and pressure differentials to accommodate special patient care areas.
- E. Location of fixed sharps containers.
- F. Types of surface finishes (non-porous vs. porous).
- G. Well-caulked wall with minimal seams.
- H. Location of adequate storage and supply areas.
- I. Appropriate location of medicine preparation areas (e.g. >3ft. from a sink).
- J. Appropriate location and type of ice machines.
- K. Appropriate materials for sinks and wall coverings.
- L. Appropriate traffic flow (no "dirty" movement through "clean" areas).
- M. Isolation rooms with anterooms as required.
- N. Appropriate flooring (e.g. seamless floors in dialysis units).
- O. Sensible use of carpeting (e.g. no carpeting in special care areas or areas likely to become wet.)
- P. Properly engineered areas for linen services and solid waste management.
- Q. Location of main generator to minimize risk of system failure from flooding or other emergency.
- R. Installation guidelines for gypsum wallboard.

From: Centers for Disease Control (2001) Guidelines for Environmental Infection Control in Healthcare Facilities (draft).

APPENDIX B:

Safety and Infection Control Risk Assessment Tool

Project No._____ Date_____Time____

DAILY INFECTION CONTROL MONITOR:

Standard	
A. Construction Barricades:	
Barricades sealed, no penetrations	
Walk-off mats at all exits	
Barricade doors have closers	
Door frames gasketed, close and seal properly	
Adjacent ceiling areas intact	
Adjacent floors clean, no dust tracked	
B. Negative Air:	
Negative pressure at barricade entrance	
All windows and doors closed behind barricade	
Negative air machines running, filters clean, discharge hoses intact	
Demonstrated use of appropriate equipment to prevent airborne particulate matter: this includes HEPA filtration units, HEPA vacuum equipment, and continuous use of exhaust fans	
No construction activity within 25 feet of existing fresh air intake	
C. Jobsite:	
Project area clean, debris removed daily	
Debris removed in suitable closed containers	
No signs of pests	
No signs of water leakage	
D. Occupied Areas:	
Work authorized and scheduled	
Sheet plastic barricade in place and properly sealed	
Surrounding area clean	
Patient care equipment and supplies removed from construction area	
Ceiling tiles replaced when not being accessed (if occupied area, adjacent patient doors are closed)	

DAILY SAFETY MONITOR:

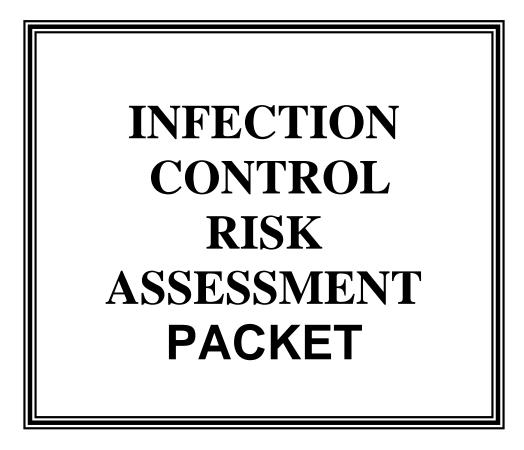
Standard		
A. General Safety:		
Contract workers wearing required identification		
Construction personnel wearing required PPE (e.g. hardhat, goggles, coveralls, etc.)		
Construction area secure (e.g. barriers adequate to prevent entry of unauthorized persons)		
Construction personnel following safe work practices (e.g. ladder safety, no smoking, trip and fall hazards, etc.)		
Power secured at end of each day		
Extension cords grounded, in good condition		
B. Exits		
Exits provide free and unobstructed access		
Alternate egress established and workers received training		
Negative air machines running, filters clean, discharge hoses intact		
C. Fire Equipment:		·
Fire alarms, detection, and suppression systems operational		
Additional fire equipment and training provided for personnel		
D. Fire Safety:		·
No smoking policy implemented		
Minimum of two fire drills per shift per quarter		
Area free of storage, housekeeping materials, food waste, and debris to reduce flammable and combustible fire load of building		

Additional comments and observations: _____

Inspector Signature: _____

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

APPENDIX C



BRH ROOF REPLACEMENT CBJ Contract No. E11-286 SPECIAL SAFETY REQUIREMENTS (ICRA) Page 015221-10

An Infection Control Risk Assessment (ICRA) will be performed by the Construction Manager or designee for every construction, demolition, and renovation project on the Bartlett Regional Hospital campus, including site work (utilities, landscaping, etc.) even when no building is being constructed or renovated.

1. Step #1: Using the following table, determine the <u>type</u> of construction activity and <u>circle</u> Type A, B, C, or D.:

The construction activity types are defined by the amount of dust generated, the duration of the activity, and the amount of shared HVAC systems.

Contact Infection Control if any activity is questionable under these guidelines.

Circle one **Type** below:

	Inspection and Non-Invasive Activities
	Includes, but is not limited to:
	• removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet
Type A	• painting (but not sanding)
	• wall covering, electrical trim work, minor plumbing, and activities which do not
	generate dust or require cutting of walls or access to ceilings other than for
	visual inspection
	Small Scale, Short Duration Activities Which Create Minimal Dust
	Includes, but is not limited to:
Туре В	• installation of telephone and computer cabling
Type D	access to chase spaces
	• cutting of walls or ceiling where dust migration can be controlled
	- cutting of wans of conting where dust migration can be controlled
	Work That Generates a Moderate to High Level of Dust or Requires Demolition or
	Removal of Any Fixed Building Components or Assemblies
	Includes, but is not limited to:
Type C	• sanding of walls for painting or wall covering
• •	• removal of floor coverings, ceiling tiles and casework
	• new wall construction
	• minor duct work or electrical work above ceilings
	• major cabling activities
	• any activity which cannot be completed within a single workshift
	Major Demolition and Construction Projects
	Major Demolition and Construction Projects
Type D	Includes, but is not limited to:
Type D	Includes, but is not limited to: • activities that require consecutive work shifts
Type D	Includes, but is not limited to:

2. Step # 2.: Using the following table, identify the Infection Control Risk Group or Groups that will be affected by the construction activity, and *circle* Group 1, 2, 3, or 4.

Group 1	Group 2	Group 3	Group 4	
Low Risk	Medium Risk	High Risk	Highest Risk	
Office Areas	• Cafeteria	• Emergency	Critical Care Unit	
Public Areas	• Patient care areas,	Department	Special Care Nursery	
(except when	inpatient and	 Radiology 	• Operating Rooms,	
associated with a	outpatient, except as	• PACU	including C-Section	
higher risk area)	noted in Groups 3 and	 Same Day Surgery 	Rooms	
• All other non-patient	4.	 Laboratory 	• Central Sterile Supply	
work areas (e.g.		Kitchen	• Endoscopy	
facilities, stores)		Obstetrics	 Infusion Therapy 	
• Behavioral Health		 Newborn Nursery 	 Pharmacy Admixture 	
Units		Pharmacy	Negative Pressure Isolation	
		• PT: Tub and Treatment	Rooms	
		Rooms		

*Circle the appropriate **Risk Group(s)** below:

3. Step # 3: Determine the Level of Infection Control Activity required by *matching* the Construction **Type** with the Risk **Level** using the matrix below.

Circle one Class below:

	Construction Activity-Infection Control Matrix Construction Activity					
Risk Level	Туре А	Туре В	Туре С	Type D		
Group 1	Ι	II	II	III/IV		
Group 2	Ι	Ш	III	IV		
Group 3	I	П	III/IV	IV		
Group 4	II	III/IV	III/IV	IV		

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

4. Step # 4. Obtain an Infection Control Permit:

- An Infection Control Permit and approval will be required when the Construction Activity and Risk Level indicate Class III or higher (shaded areas).
- This permit will remain posted at the worksite for the duration of the project.
- This permit will be returned to the Construction Manager or designee at the completion of the project.

5. Step # 5. Identify Areas Surrounding Project Area

Identify Unit Below	Identify Unit Above	Identify Lateral Unit	Identify Lateral Unit	Identify Unit Behind	Identify Unit Front
Identify Risk	Identify Risk	Identify Risk	Identify Risk	Identify Risk	Identify Risk
Group:	Group	Group	Group	Group	Group
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
Potential	Potential	Potential	Potential	Potential	Potential
Impact?	Impact?	Impact?	Impact?	Impact?	Impact?
YesNo	YesNo	YesNo	YesNo	YesNo	YesNo
See	See	See	See	See	See
comments	comments	comments	comments	comments	comments

Identify the **areas** surrounding the project area, assessing potential impact. *

*note:

Another aspect of "Areas Surrounding Project Area" are any nearby buildings where patients are present that could be in the path of blown dust coming from building demolition, excavation, foundation construction, and site work

6. Step # 6. Identify specific site of activity, e.g.: patient rooms, medication room, etc._____

7. Step # 7. Work hours: Can or will the work be done during non-patient care hours? Yes_____ No_____ Not applicable_____

Other

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

INFECTION CONTROL PERMIT

Bartlett Regional Hospital Infection Control Construction Permit									
					Permit No:				
Location of Construction:				Project Start Date:					
Project Coordinator				Estimated Duration:					
Contractor Performing Work				Pern	nit Expiration Date:				
Supe	rvisor			Tele	ephone:				
YES			YES	NO	NO INFECTION CONTROL RISK GROUP				
		TYPE A: Inspection, non-invasive activity			GROUP 1: Least Risk				
		TYPE B: Small scale, short duration, moderate to high levels		GROUP 2: Medium Risk					
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for completion		GROUP 3: Medium/High Risk					
		TYPE D: Major duration and construction activities Requiring consecutive work shifts		GROUP 4: Highest Risk					
CLAS	IS I	 Execute work by methods to minimize raising dust from construction operations. Immediately replace any ceiling tile displaced for visual inspection. 	3.	. Minor Demolition for Remodeling					
CLAS	S II	1. Provides active means to prevent air-borne dust from		· · · · · · · · · · · · · · · · · · ·					
		dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting.		covered containers. Wet mop and/or vacuum with HEPA filtered vacuum before					
		3. Seal unused doors with duct tape.	I	leaving work area. Place dust mat at entrance and exit of work area. Remove or isolate HVAC system in areas where work is					
		 Block off and seal air vents. Wipe surfaces with disinfectant. 							
-				being performed.					
CLAS		1. Obtain infection control permit before construction		/acuum work with HEPA filtered vacuums. Vet mop with disinfectant					
				8. Remove barrier materials carefully to minimize spreading					
		done to prevent contamination of the duct system.		of dirt and debris associated with construction. Contain construction waste before transport in					
		 Complete all critical barriers or implement control cube method before construction begins. 	9.	Contain	i construction waste before transport in				
Da	ite	4. Maintain negative air pressure within work site		tightly covered containers.					
Init	ial				Cover transport receptacles or carts. Tape covering. Remove or isolate HVAC system in areas where work is				
		project is thoroughly cleaned by Env. Services Dept.	· · ·						
Class IV be 2. Is do		begins.		covers					
								done to prevent contamination of duct system.	
		Da	ite	 Complete all critical barriers or implement control cube method before construction begins. 		Dept. Vacuum work area with HEPA filtered vacuums.			
Init	ial	4. Maintain negative air pressure within work site	10. Wet mop		et mop with disinfectant.				
	ilai	utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures			e barrier materials carefully to minimize spreading nd debris associated with construction.	l.			
	appropriately. 12.		12.	Contain construction waste before transport in tightly					
		 Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a 			l containers. ransport receptacles or carts. Tape covering.				
HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.		HEPA vacuum cleaner before leaving work site or		Remove	e or isolate HVAC system in areas where is being				
		(done.						
Additic	onal Re	quirements:							
					Exceptions/Additions to this permit				
Date	Date Initials			Da	Date, Initials are noted by attached memoranda.				

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

SPECIAL SAFETY REQUIREMENTS (ICRA) Page 015221-14

Cut here and hang from door knob

Bartlett Regional Hospital

MAINTENANCE/CONSTRUCTION IN PROCESS

KEEP DOOR CLOSED

Per Infection Control Policy Contact the Project Manager

at _____ for questions

Bartlett Regional Hospital BRH ROOF REPLACEMENT CBJ Contract No. E11-286

Title: Interim Life Safety Plan

Department/s: All Departments

Original Date:

Author: B. Sharp

PURPOSE: To provide protection when normal life safety processes are affected by construction to temporarily compensate for the hazard posed by existing life safety deficiencies.

POLICY:

A. The Safety Officer will:

- A.1. Be responsible for training personnel working in the construction areas to the ILSM program. Documentation of this training will be maintained in the employees file.
- A.2. All hospital staff will be trained when structural and component features of fire safety are compromised.
- B. The Construction Manager will:
 - B.1. Be responsible for initiation of the Interim Life Safety Measures to ensure that a safe environment is maintained throughout construction or alterations to buildings and grounds.
 - B.2. Be responsible for training the contractor or designee in the elements of the BRH life safety and interim life safety measures.
- C. Free and unobstructed access to all existing exits in the building under construction will be provided at all times. Personnel will receive training if alternate exits must be designated.

D. Free and unobstructed access to emergency departments or services shall be maintained at all times.

- E. Fire alarm, detection and suppression systems must not be impaired. A temporary but equivalent system will be provided when any fire alarm system is impaired. Temporary systems will be tested and inspected monthly. If a fire alarm system or the fire suppression systems are taken out of service or impaired for a period greater than 4 hours in a 24 hour period, the fire department will be notified and a fire watch provided.
- F. Temporary construction partitions will be smoke tight and built of noncombustible materials.
- G. The no-smoking policy in construction areas will be strictly enforced in accordance with BRH tobacco use policy.
- H. Storage and removal of construction debris that reduces the flammable and combustible fire load to the lowest level necessary for daily operations will be strictly enforced.
- I. The frequency of fire drills will be increased to two per shift per quarter.
- J. Hazard surveillance of buildings, construction areas and construction storage will be increased.

SCOPE: All employees in all departments of BRH.

PROCEDURE:

- A. The Construction Manager and the Facilities Manager will facilitate compliance with ILSM using BRH Interim Life Safety Measures checklist.
- B. The Construction Manager, Facilities Manager or designee will conduct daily inspections of all major construction areas where life safety deficiencies may exist. These inspections will be documented and deficiencies will be corrected immediately.
- C. The Construction Manager, Facilities Manager or a designee will ensure that the ILSM deficiencies are resolved as soon as possible and monitored daily until completed.
- D. The Safety Officer or designee will receive periodic updates concerning the ILSM programs and will report compliance to the Safety Committee and include this information in the quarterly board report.

REFERENCES:

Interim Life Safety Code, NFPA 101-1997

JCAHO 2002 Hospital Accreditation Standards, EC 1.5

Approval/Review/Revision						
Date:	Signature:	Date:	Signature:	Date:	Signature:	

END OF SECTION

SECTION 015250 - SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.1 CONTRACTOR'S WORK AND STORAGE AREA

- A. The CONTRACTOR may be allowed limited areas for non-hazardous on-site storage (in addition to CONTRACTOR staging Area) necessary for the proper execution of the WORK. Such areas will be authorized by the OWNER at the Pre-Construction conference.
- B. The CONTRACTOR shall construct and use a separate storage area for hazardous materials used in constructing the WORK.
- C. The CONTRACTOR shall construct and use a separate temporary construction stair to the roof; to be used throughout constructing the WORK for the duration of construction. CONTRACTOR shall submit design of construction entrance with supporting documents and Engineers seals as may be required, to the ARCHTITECT and construct only when written permission is obtained from the ARCHITECT and governing authorities having jurisdictions. The temporary construction stairs to the roof shall be removed upon completion of the construction WORK and the surround areas returned to the condition prior to the construction WORK.
- D. The CONTRACTOR shall have use of the OWNER's elevators and stairs, only upon written permission being granted on a per use requirement. CONTRACTOR shall request from the OWNER at least 72 hrs in advance of the requirement for use.

1.2 CONTRACTOR'S WORK AND STORAGE AREA

- A. The CONTRACTOR shall be allowed limited areas for non-hazardous on-site storage necessary for the proper execution of the WORK. Such areas will be authorized by the OWNER at the Pre-Construction conference.
- B. Should the CONTRACTOR find it necessary to use any additional land for its camp or for other purposes during the construction of the WORK, it shall provide for the use of such lands at its own expense.
- C. The CONTRACTOR shall not store materials, tools, or equipment in areas to be occupied by the public unless specifically authorized by the ARCHITECT.

1.3 PARKING

- A. The CONTRACTOR shall direct its employees to park in areas at the site as indicated on the drawings and as directed by the ARCHITECT.
- B. Traffic and parking areas available to the public shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. The CONTRACTOR shall repair breaks, potholes, low areas which collect standing water, and other deficiencies that are the result of the CONTRACTOR's WORK.

PART - 2 PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015250

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 015000 Temporary Facilities and Controls.
- B. Section 015221 Special Safety Requirements (ICRA).

1.2 RUBBISH CONTROL

A. During the progress of the WORK, the CONTRACTOR shall keep the site of the WORK and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The CONTRACTOR shall dispose of all rubbish and waste materials of any nature occurring at the WORK site, and shall establish regular intervals of collection and disposal of such materials and waste. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

1.3 CHEMICALS

A. All chemicals used during Project construction or furnished for Project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer. In addition, see the requirements set forth in paragraph 6.11 of the General Conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015260

0SECTION 016000 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. The word "Products," as used herein, is defined to include purchased items for incorporation into the WORK, regardless of whether specifically purchased for Project or taken from CONTRACTOR's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
- B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the WORK.

1.2 QUALITY ASSURANCE

- A. Source Limitations: To the greatest extent possible for each unit of work, the CONTRACTOR shall provide products, materials, or equipment of a singular generic kind from a single source.
- B. Compatibility of Options: Where more than one choice is available as options for CONTRACTOR's selection of a product, material, or equipment, the CONTRACTOR shall select an option which is compatible with other products, materials, or equipment already selected. Compatibility is a basic general requirement of product/material selections.

1.3 PRODUCT DELIVERY-STORAGE-HANDLING

A. The CONTRACTOR shall deliver, handle, and store products in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, the CONTRACTOR shall ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.

1.4 TRANSPORTATION AND HANDLING

- A. Products shall be transported by methods to avoid product damage and shall be delivered in undamaged condition in manufacturer's unopened containers or packaging.
- B. The CONTRACTOR shall provide equipment and personnel to handle products, materials, and equipment by methods to prevent soiling and damage.

0SECTION 016000 – PRODUCT REQUIREMENTS

C. The CONTRACTOR shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

1.5 STORAGE AND PROTECTION

- A. Products shall be stored in accordance with manufacturer's written instructions, with seals and labels intact and legible. Sensitive products shall be stored in weather-tight climate controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's written instructions.
- B. For exterior storage of fabricated products, they shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering; ventilation shall be provided to avoid condensation.
- C. Storage shall be arranged to provide access for inspection. The CONTRACTOR shall periodically inspect to assure products are undamaged and are maintained under required conditions.
- D. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

1.6 MAINTENANCE OF STORAGE

- A. Stored products shall be periodically inspected on a scheduled basis. The CONTRACTOR shall maintain a log of inspections and shall make said log available on request.
- B. The CONTRACTOR shall verify that storage facilities comply with manufacturer's product storage requirements.
- C. The CONTRACTOR shall verify that manufacturer-required environmental conditions are maintained continually.
- D. The CONTRACTOR shall verify that surfaces of products exposed to the elements are not adversely affected and that any weathering of finishes does not occur.
- E. For mechanical and electrical equipment, the CONTRACTOR shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.
- F. Products shall be serviced on a regularly scheduled basis, and a log of services shall be maintained and submitted as a record document prior to acceptance by the OWNER in accordance with the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

SECTION 017350 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DEFINITION

A. "Cutting-and-Patching" is defined to include the cutting and patching of nominally completed and previously existing concrete, steel, wood and miscellaneous metal structures; piping and pavement, in order to accommodate the coordination of WORK, or the installation of other facilities or structures or to uncover other facilities and structures for access or inspection, or to obtain samples for testing, or for similar purposes.

1.2 REQUIREMENTS OF STRUCTURAL WORK

- A. Structural WORK shall not be cut and patched in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.
- B. Prior to cutting and patching the following categories of WORK, the CONTRACTOR shall obtain the ARCHITECT's approval to proceed with:
 - 1. Structural steel
 - 2. Miscellaneous structural metals, including equipment supports, stair systems and similar categories of WORK
 - 3. Structural concrete
 - 4. Foundation construction
 - 5. Structural decking
 - 6. Exterior curtain wall construction
 - 7. Pressurized piping, vessels and equipment

1.3 OPERATIONAL AND SAFETY LIMITATIONS

- A. The CONTRACTOR shall not cut and patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance, or decreased safety.
- B. Prior to cutting and patching the following categories of WORK, the CONTRACTOR shall obtain the ARCHITECT's approval to proceed with:
 - 1. Operating systems and equipment
 - 2. Water, moisture, vapor, air, smoke barriers, membranes and flashings
 - 3. Noise and vibration control elements and systems
 - 4. Control, communication, conveying and electrical wiring systems

1.4 VISUAL REQUIREMENTS

A. The CONTRACTOR shall not cut and patch WORK which is exposed on the exterior or exposed in occupied spaces, in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of the cut and patch WORK, both as judged solely by the ARCHITECT. The CONTRACTOR shall remove and replace WORK judged by the ARCHITECT to have been cut

SECTION 017350 - CUTTING AND PATCHING

and patched in a visually unsatisfactory manner.

1.5 APPROVALS

- A. Where prior approval of cutting and patching is required, the CONTRACTOR shall submit the request well in advance of time WORK will be performed. The request should include a description of why cutting and patching cannot reasonably be avoided, how it will be performed, how structural elements (if any) will be reinforced, products to be used, firms and tradesmen to perform the WORK, approximate dates of the WORK, and anticipated results in terms of structural, operational, and visual variations from the original WORK.
- B. The CONTRACTOR shall also request approval to proceed prior to starting WORK of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS USED IN CUTTING AND PATCHING

- A. Except as otherwise indicated, the CONTRACTOR shall provide materials for cutting and patching which will result in equal-or-better WORK than the WORK being cut and patched, in terms of performance characteristics and including visual effects where applicable. The CONTRACTOR shall use material identical with the original materials where feasible.
- B. Materials shall comply with the requirements of the Technical Specifications wherever applicable.

PART 3 - EXECUTION

3.1 PREPARATION

- A. The CONTRACTOR shall provide adequate temporary support for WORK to be cut to prevent failure.
- B. The CONTRACTOR shall provide adequate protection of other WORK during cutting and patching.

3.2 INSTALLATION

- A. The CONTRACTOR shall employ skilled tradespeople to perform cutting and patching. Except as otherwise indicated, the CONTRACTOR shall proceed with cutting and patching at the earliest feasible time and perform the WORK promptly.
- B. The CONTRACTOR shall use methods least likely to damage WORK to be retained and WORK adjoining.
 - 1. In general, where physical cutting action is required, the CONTRACTOR shall cut WORK

SECTION 017350 - CUTTING AND PATCHING

- 2. Comply with the requirements of Technical Specifications wherever applicable.
- 3. Comply with the requirements of applicable sections of Division 2 where cutting and patching requires excavating and backfilling.
- C. The CONTRACTOR shall patch with seams which are as invisible as possible and comply with specified tolerances for the WORK.
- D. The CONTRACTOR shall restore exposed seams of patched area; and, where necessary, extend finish restoration onto retained WORK adjoining, in a manner which will eliminate evidence of patching.

END OF SECTION 017350

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 CLOSEOUT TIMETABLE

A. The CONTRACTOR shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the OWNER, the ARCHITECT, and their authorized representatives sufficient time to schedule attendance at such activities.

1.2 SUBSTANTIAL COMPLETION

- A. Before requesting inspection for certification of Substantial Completion, complete the following:
 - 1. In the Application for Payment that coincides with the date Substantial Completion is claimed, show 100 percent completion for the portion of the WORK claimed substantially complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - 3. Submit record Drawings, maintenance manuals, damage or settlement survey, property survey, and similar record information.
 - 4. Changeover permanent locks and transmit keys to the ARCHITECT.
 - 5. Complete start-up testing of systems, and instruction of BRH Maintenance personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - 6. Complete final clean-up. Touch-up and repair and restore marred exposed finishes.

1.3 INSPECTION PROCEDURES

- A. Upon receipt of a request for inspection for Substantial Completion, the ARCHITECT will proceed and advise the CONTRACTOR of unfilled requirements. The ARCHITECT will prepare the Certificate of Substantial Completion following inspection, or advise the CONTRACTOR of construction that must be completed or corrected before the certificate will be issued.
- B. The ARCHITECT will reinspect the WORK upon receipt of notice by the CONTRACTOR that the WORK has been completed, except items whose completion has been delayed because of circumstances acceptable to the ARCHITECT. If reinspection is requested and the CONTRACTOR has not completed all punch list items, the cost of that inspection will be paid by the CONTRACTOR. Upon completion of reinspection, the ARCHITECT will prepare a certificate of final acceptance, or advise the CONTRACTOR of WORK that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. If necessary, reinspection will be repeated.
 - 1. The ARCHITECT will repeat inspection when requested and assured by the CONTRACTOR that the WORK has been substantially completed.
 - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

SECTION 017700 - CLOSEOUT PROCEDURES

1.4 FINAL ACCEPTANCE

- A. Before requesting inspection for certification of final acceptance and final payment, complete and submit the following:
 - 1. Final payment request.
 - 2. Final Change Order request.
 - 3. Copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
 - 4. Final meter readings for utilities, a record of stored fuel, and similar data as of Substantial Completion.
 - 5. Consent of surety to final payment.
 - 6. Evidence of continuing insurance coverage complying with insurance requirements.
 - 7. Those items listed under Article 1.5 of this section as they apply.
 - 8. Written guarantees, where required.
 - 9. Maintenance stock items; spare parts; special tools, where required.
 - 10. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
 - 11. Releases from all parties who are entitled to claims against the subject Project, property, or improvement pursuant to the provisions of law.
 - 12. Completed Certificate of Compliance and Release for the CONTRACTOR involved in the WORK included as part of this section.
 - 13. Before final payment can be made, the CONTRACTOR shall supply a copy of the "Notice of Completion of Public Works" form approved by Wage and Hour Administration of the Labor Standards and Safety Division of the Alaska Department of Labor and Workforce Development.
 - 14. Alaska Department of Labor Employment Security Tax Clearance letter for the Prime CONTRACTOR and all Subcontractors, a copy of which is located at the end of Section 00800 Supplementary General Conditions.
- B. Submit Items 12, 13 and 14 to Jennifer Mannix, Contract Administrator, CBJ- Engineering.

1.5 FINAL SUBMITTALS

- A. Record Document Submittals: Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the ARCHITECT's reference.
- B. Record Drawings: Maintain a clean, undamaged set of blue or blackline prints of Contract Drawings and Shop Drawings (this includes Architectural, Structural/Civil, Mechanical and Electrical). Mark-up these Drawings to show the actual installation. Mark whichever Drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Organize record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover. Record Drawings shall be kept current with the WORK's progress and will be checked prior to each payment.
- C. Record Specifications: Maintain one copy of the Contract Specifications, including Addenda. Mark to show variations in actual WORK performed in comparison with the specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record Drawing information and product data. Upon completion of the

SECTION 017700 - CLOSEOUT PROCEDURES

WORK, submit record Specifications to the ARCHITECT for the OWNER's records.

- D. Maintenance Manuals: Organize maintenance data into sets of manageable size. Bind in individual heavy-duty 2-inch (maximum), 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:
 - 1. Emergency instructions.
 - 2. Spare parts list.
 - 3. Copies of warranties.
 - 4. Recommended "turn around" cycles.
 - 5. Inspection procedures.
 - 6. Shop Drawings and product data.
- E. Operating and Maintenance Instructions: Arrange for the installer of equipment that requires regular maintenance to meet with CBJ personnel to provide instruction in proper operation and maintenance. Include a detailed review of maintenance manuals, agreements, warranties and bonds. As part of instruction for operating equipment, demonstrate all necessary safety procedures.

1.6 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall comply with the maintenance and guarantee requirements contained in Article 13 of the General Conditions.
- B. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the OWNER. If the CONTRACTOR fails to make such repairs or replacements promptly, the OWNER reserves the right to do the WORK and the CONTRACTOR and its surety shall be liable to the OWNER for the cost thereof.

PART 2 - MATERIALS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 017700 – CLOSEOUT PROCEDURES

COMPLIANCE CERTIFICATE AND RELEASE FORM

PROJECT:BARTLETT REGIONAL HOSPITAL ROOF REPLACEMENTCONTRACT NO:E11-286

The CONTRACTOR must complete and submit this to the Contract Administrator. The CONTRACTOR shall complete this form with respect to the entire contract.

Completed forms must be submitted upon completion of the Project. All requirements and submittals must be met before final payment will be made to the CONTRACTOR.

I certify that the following and any referenced attachments are true:

- All WORK has been performed, materials supplied, and requirements met in accordance with the applicable plans, specifications, and Contract Documents.
- All suppliers and Subcontractors have been paid in full with no claims for labor, materials, or other services outstanding. If all Subcontractors and suppliers are not paid in full, please explain on a separate sheet.
- All employees have been paid not less that the current prevailing wage rates set by the State of Alaska (or U.S. Department of Labor, as applicable).
- All equal employment opportunity, certified payroll and other reports have been filed in accordance with the prime contract.
- The attachment list of Subcontractors is complete (required from CONTRACTORs). The Contract Administrator was advised and approved of all Subcontractors before WORK was performed and has approved any substitutions of Subcontractors.
- All DBE firms listed as a precondition of the prime contract award must have performed a commercially useful function in order for the work to count to a DBE goal. All DBE firms performed the WORK stated and have received at least the amount claimed for credit in the Contract Documents.
- All DBE Subcontractors must attach a signed statement of the payment amount received, the nature of WORK performed, whether any balance is outstanding, and indicate that no rebates are involved.
- If the amount paid is less than the amount originally claimed for DBE credit, the CONTRACTOR has attached approval from the Contract Administrator for underutilization.

I understand it is unlawful to misrepresent information in order to receive a payment which would otherwise be withheld if these conditions were not met. I am an authorized agent of this firm and sign this freely and voluntarily. The foregoing statements are true and apply to the following project contractor.

Firm Name

- -

Capacity: CONTRACTOR

Signed

Printed Name and Title

Date

Return completed form to: Jennifer Mannix, Contract Administrator, City and Borough of Juneau, 155 South Seward Street, Juneau, AK 99801. Call (907) 586-0873 if we can be of further assistance or if you have any questions.

END OF SECTION 017700

SECTION 017704 - FINAL CLEAN-UP

PART 1 - GENERAL

1.1 DESCRIPTION

A The WORK under this Section includes providing all supervision, labor, materials, tools and equipment necessary for final clean-up and restoration of all areas disturbed by construction activities, to a condition equal to, or better than, before construction started. This does not include clean-up or restoration incidental to, or directly provided for by other construction items.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Any materials required shall conform to the appropriate Section of these Specifications.

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall promptly remove from the vicinity of the completed WORK and all sites disturbed by the construction, all rubbish and debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction and shall grade the sites so that no standing water is evident. Restore site and structure disturbed by construction to preconstruction conditions. Final acceptance of the WORK by the OWNER will be withheld until the CONTRACTOR has satisfactorily complied with the foregoing requirements for final clean-up of the Project site.

3.2 FINAL CLEANING OF BUILDINGS

- A. The CONTRACTOR shall employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following before requesting inspection for certification of Substantial Completion:
 - 1. Remove labels that are not permanent labels.
 - 2. Clean transparent materials. Remove glazing compound. Replace chipped or broken glass.
 - 3. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - 5. Clean the site of rubbish, litter and other foreign substances.
 - 6. Remove temporary protection and facilities.
 - 7. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.
 - 8. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION 017704

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Predemolition Photographs: Submit before Work begins.
- F. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs and templates.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 01100 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Contractor shall notify owner a minimum of 72 hour in advance of and obtain approval by owner, prior to shut off indicated services/systems when requested by Contractor, so that a time can be coordinated and arranged.
 - 2. Arrange to shut off indicated utilities with utility companies.

- 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
- 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Section 01500 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01500 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 9. Dispose of demolished items and materials promptly. Comply with requirements in Section 0174 "Construction Waste Management and Disposal."
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area off-site.
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Roofing: See section 074213.19 "Preparation for RE- Roofing" for removal of existing roof system and Section 075323 "Ethylene–Propylene-Diene-Monomer (EPDM) Roofing " for new roofing requirements.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 0174 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Burning: Burning of demolished materials will not be permitted on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.3 ACTION SUBMITTALS

- A. General: In addition to the following, comply with submittal requirements in ACI 301.
- B. Product Data: For each type of product indicated.
- C. Design Mixtures: For each concrete mixture.

1.4 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing readymixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.
- B. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- C. Comply with ACI 301.
- D. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and formwork accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I or II or Type I/II
- B. Normal-Weight Aggregate: ASTM C 33, graded, 1-1/2-inch nominal maximum aggregate size.
- C. Water: Potable and complying with ASTM C 94.
- D. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.

2.4 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent watersoluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

2.6 CONCRETE MIXTURES

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. 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 (28 Days): 4000 psi.
 - 2. Slump: 4 inches.

- C. Synthetic Micro-Fiber: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.
 - 3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Monofilament Micro-Fibers:
 - 1) Axim Italcementi Group, Inc.; Fibrasol II P.
 - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand.
 - 3) FORTA Corporation; FORTA Econo-Mono.
 - 4) Grace Construction Products, W. R. Grace & Co.; Grace MicroFiber.
 - 5) Metalcrete Industries; Polystrand 1000.
 - 6) Nycon, Inc.; ProConM.
 - 7) Propex Concrete Systems Corp.; Fibermesh 150.
 - 8) Sika Corporation; Sika Fiber PPM.
 - b. Fibrillated Micro-Fibers:
 - 1) Axim Italcementi Group, Inc.; Fibrasol F.
 - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand F.
 - 3) FORTA Corporation; FORTA [Econo-Net] [Ultra-Net].
 - 4) Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
 - 5) Nycon, Inc.; ProConF.
 - 6) Propex Concrete Systems Corp.; Fibermesh 300.
 - 7) Sika Corporation; Sika Fiber PPF.
- D. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0 percent within a tolerance of plus 1.0 or minus 1.5 percent.
 - 4. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116.
 - 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.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

- A. 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.

3.4 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement.
- C. Consolidate concrete with mechanical vibrating equipment.

3.5 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with the 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. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.6 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. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
 - 1. Do not further disturb surfaces before starting finishing operations.

3.7 TOLERANCES

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. 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. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. 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.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests: Perform according to ACI 301.
 - 1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. or fraction thereof.

3.10 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 033053

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof deck.
 - 2. Composite roof(floor) deck.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product certificates.
- C. Evaluation reports.
- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code Sheet Steel."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 COMPOSITE ROOF DECK

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Epic Metals Corporation.
 - 2. Nucor Corp.; Vulcraft Group.
 - 3. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.
- B. Composite Roof Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G90 (Z275) zinc coating.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- G. Galvanizing Repair Paint: ASTM A 780 or SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- G. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner.
 - 1. Install reinforcing channels or zees in ribs to span between supports and weld.
- H. Deck Closures: Weld steel-sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Field welds will be subject to inspection. BRH ROOF REPLACEMENT CBJ Contract No. E11-286

- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.3 **PROTECTION**

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior non-load-bearing wall framing.
- B. Related Requirements:
 - 1. Section 074213 "Formed Metal Wall Panels" for walls at precast concrete and penthouse walls.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed steel framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.

- C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code Sheet Steel."
- D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing Prescriptive Method for One and Two Family Dwellings."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. ClarkWestern Building Systems, Inc.
 - 2. Consolidated Fabricators Corp.; Building Products Division.
 - 3. Dietrich Metal Framing; a Worthington Industries Company.
 - 4. Nuconsteel; a Nucor Company.
 - 5. SCAFCO Corporation.

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- 6. Steel Structural Systems.
- 7. United Metal Products, Inc.
- 8. United Steel Manufacturing.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01400 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: 80 psf.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/720 of the wall height.
 - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1/4 inch.
 - 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
 - 1. Floor and Roof Systems: AISI S210.
 - 2. Wall Studs: AISI S211.
 - 3. Headers: AISI S212.
 - 4. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 COLD-FORMED STEEL FRAMING, GENERAL

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90 or equivalent.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 2 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: Matching steel studs.
 - 2. Flange Width: 1-1/4 inches.
- C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AllSteel & Gypsum Products, Inc.
 - b. ClarkWestern Building Systems, Inc.
 - c. Dietrich Metal Framing; a Worthington Industries company.
 - d. SCAFCO Corporation.
 - e. Steel Network, Inc. (The).
 - f. Steeler, Inc.
- D. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Gusset plates.
 - 7. Stud kickers and knee braces.
 - 8. Joist hangers and end closures.
 - 9. Hole reinforcing plates.
 - 10. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 55, threaded carbon-steel hex-headed bolts and carbonsteel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C or mechanically deposition according to ASTM B 695, Class 50.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

2.8 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold-formed steel framing according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install load bearing shims at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 FIELD QUALITY CONTROL

- A. Field and shop welds will be subject to testing and inspecting.
- B. Remove and replace work where test results indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous steel framing and supports.

B. Related Sections:

- 1. Division 3 Section "Miscellaneous Cast-In-Place Concrete."
- 2. Division 5 Section "Steel Deck."

1.2 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications.
 - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- B. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Qualification Data: For qualified professional engineer.
- D. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.
- E. Welding certificates.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed WORK, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- C. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at interior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Eyebolts: ASTM A 489.
- E. Machine Screws: ASME B18.6.3.
- F. Lag Screws: ASME B18.2.1.
- G. Wood Screws: Flat head, ASME B18.6.1.
- H. Plain Washers: Round, ASME B18.22.1.
- I. Lock Washers: Helical, spring type, ASME B18.21.1.
- J. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- K. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Concrete: Comply with requirements in Division 3 Section "Miscellaneous Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 4000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
- F. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- C. Fabricate steel pipe columns for supporting coiling doors and grilles from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
 - 1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe or tubes.
 - 2. Unless otherwise indicated, provide 1/2-inch baseplates with four 5/8-inch anchor bolts and 1/4-inch top plates.
- D. Galvanize miscellaneous framing and supports where indicated.

- 2.7 Prime miscellaneous framing and supports with zinc-rich primer where indicated.
 - A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - B. Finish metal fabrications after assembly.

2.8 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with zinc-rich primer.
- C. Preparation for Shop Priming: requirements indicated below:
 - 1. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

METAL FABRICATIONS 055000 - 5 E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Preassembled Industrial-type crossovers ladder with steel grating treads.
- B. Related Sections:
 - 1. Section 0075323 "EPDM Roofing" for installation.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Uniform Load: 100 lbf/sq. ft..
 - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to L/360 ratio or 1/4 inch, whichever is less.
- C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Infill load and other loads need not be assumed to act concurrently.
- D. Seismic Performance: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

BRH ROOF REPLACEMENT CBJ Contract No. E11-286

1. Component Importance Factor is 1.5.

1.4 ACTION SUBMITTALS

- A. Product Data: For metal stairs and the following:
 - 1. Prefilled metal-pan stair treads.
 - 2. Precast concrete treads.
 - 3. Epoxy-resin-filled stair treads.
 - 4. Nonslip aggregates and nonslip-aggregate finishes.
 - 5. Abrasive nosings.
 - 6. Metal floor plate treads.
 - 7. Paint products.
 - 8. Grout.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes:
 - 1. Grating treads.
- E. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified professional engineer.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for stairs and railings.
 - 1. Test railings according ASTM E 894 and ASTM E 935.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

- 1. Preassembled Industrial-Type Stairs: Industrial class for exterior stairs.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - 2. AWS D1.3, "Structural Welding Code Sheet Steel."

1.7 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so that they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 513.
- C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- D. Abrasive-Surface Floor Plate: Steel plate with abrasive material metallically bonded to steel.
- E. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- F. Wire Rod for Grating Crossbars: ASTM A 510.

- G. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- H. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 coating, structural steel, Grade 33, unless another grade is required by design loads.
- I. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- J. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.
- K. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

2.3 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for **exterior stairs**.
- D. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
- E. Machine Screws: ASME B18.6.3.
- F. Lag Screws: ASME B18.2.1.
- G. Plain Washers: Round, ASME B18.22.1.
- H. Lock Washers: Helical, spring type, ASME B18.21.1.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
 - 3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.6 STEEL-FRAMED CROSSOVER LADDERS

- A. Basis-of-Design Product: Provide product with perforations matching **fsIndustries** Engineered Steel Products; PO Box 7259 providence RI, 02907; (800) 421-0314; CROSSOVERS with 12" standoff through roof assembly.
- B. Design by manufacture with Engineer Seal and calculations.
 - 1. Design for seismic considerations.
- C. <u>Manufacturers</u>: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. <u>American Stair, Inc</u>.
 - 2. Bustin Industrial Products
 - 3. Lapeyre Stair
 - 4. Metal Stair Products
 - 5. SafeRack
 - 6. Wolfe Industrial
- D. Stair Framing:
 - 1. Fabricate stringers of steel channels.
 - a. Provide closures for exposed ends of channel stringers.
 - 2. Construct platforms of steel plate, channel headers and miscellaneous framing members as needed to comply with performance requirements.
 - 3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
- E. Metal Floor Plate Stairs: Form treads and platforms to configurations shown from abrasivesurface floor plate of thickness needed to comply with performance requirements, but not less than 3/16 inch.
 - 1. Form treads with integral nosing and back edge stiffener, and with open risers.
 - 2. Weld steel supporting brackets to stringers and weld treads to brackets.
 - 3. Fabricate platforms with integral nosings matching treads and weld to platform framing.

2.7 STAIR RAILINGS

- A. Comply with applicable requirements.
 - 1. Fabricate newels of square steel tubing and provide newel caps of pressed steel, as shown.
 - 2. Rails may be bent at corners, rail returns, and wall returns, instead of using prefabricated fittings.
 - 3. Connect posts to stair framing by direct welding unless otherwise indicated.

- B. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
 - 1. Rails and Posts: 1-5/8-inch- diameter top, middle and bottom rails and 1-5/8-inch-diameter posts.
- C. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- D. Form changes in direction of railings as follows:
 - 1. By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated.
- E. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- F. Close exposed ends of railing members with prefabricated end fittings.
- G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 1. Connect posts to stair framing by direct welding unless otherwise indicated.
 - 2. For galvanized railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
 - 3. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
- I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.8 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Finish metal stairs after assembly.
- C. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
 - 2. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- E. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

3.2 INSTALLING METAL STAIRS WITH GROUTED BASEPLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of baseplates.
- B. Set steel stair baseplates on wedges, shims, or leveling nuts. After stairs have been positioned and aligned, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
 - 1. Use nonmetallic, nonshrink grout unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 - 1. Anchor posts to steel by welding directly to steel supporting members.

3.4 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055100

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Rooftop equipment bases and support curbs.
 - 2. Wood blocking, cants, and nailers.
 - 3. Wood furring and grounds.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NHLA: National Hardwood Lumber Association.
 - 3. NLGA: National Lumber Grades Authority.
 - 4. SPIB: The Southern Pine Inspection Bureau.
 - 5. WCLIB: West Coast Lumber Inspection Bureau.
 - 6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

- 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- 5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Fire-retardant-treated wood.
 - 2. Power-driven fasteners.
 - 3. Expansion anchors.
 - 4. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fireretardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 Insert other items that require treatment but are not likely to be indicated on Drawings.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841. Retain option in first paragraph below if required for plywood backing panels.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- E. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Concealed blocking.
 - 2. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
 - 3. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade of any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.

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- 4. Hem-fir; WCLIB or WWPA.
- 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- 6. Northern species; NLGA.
- 7. Eastern softwoods; NeLMA.
- 8. Western woods; WCLIB or WWPA.
- B. Other Framing: No. 2 grade and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Southern pine; SPIB.
 - 3. Douglas fir-larch; WCLIB or WWPA.
 - 4. Mixed southern pine; SPIB.
 - 5. Spruce-pine-fir; NLGA.
 - 6. Douglas fir-south; WWPA.
 - 7. Hem-fir; WCLIB or WWPA.
 - 8. Douglas fir-larch (north); NLGA.
 - 9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
 - 6. Grounds.
 - 7. Utility shelving.
- B. For items of dimension lumber size, provide Construction or No. 2and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
 - 6. Western woods; WCLIB or WWPA.
 - 7. Northern species; NLGA.
 - 8. Eastern softwoods; NeLMA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 WOOD PANEL PRODUCTS

- A. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.7 WALL SHEATHING

- A. Plywood Wall Sheathing: Exterior sheathing.
 - 1. Nominal Thickness: As indicated.

2.8 ROOF SHEATHING

- A. Plywood Roof Sheathing: Exterior sheathing.
 - 1. Nominal Thickness: As indicated.

2.9 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

2.10 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- C. Nails, Brads, and Staples: ASTM F 1667.
- D. Power-Driven Fasteners: NES NER-272.
- E. Wood Screws: ASME B18.6.1.

- F. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- G. Lag Bolts: ASME B18.2.
- H. Bolts: Steel bolts complying with ASTM A 307, Grade A with ASTM A 563 hex nuts and, where indicated, flat washers.
- I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.11 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cleveland Steel Specialty Co.
 - 2. KC Metals Products, Inc.
 - 3. Phoenix Metal Products, Inc.
 - 4. Simpson Strong-Tie Co., Inc.
 - 5. USP Structural Connectors.
- B. Stainless-Steel Sheet: ASTM A 666, Type 316.

2.12 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring to Concrete: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
 - 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with

function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

- J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- K. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.4 **PROTECTION**

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 070150.19 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof tear-off.
 - 2. Temporary roofing membrane.
 - 3. Removal of base flashings.
- B. Related Sections:
 - 1. Section 01100 "Summary" for use of the premises and phasing requirements.
 - 2. Section 01500 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.
 - 3. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 - 4. Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Membrane" for roofing membrane, substrate boards, vapor barrier, roof insulation, cover boards, and roofing accessories.
 - 5. Section 076200 "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Existing Membrane Roofing System: Asphaltic and EPDM roofing membrane, roof insulation, surfacing, and components and accessories between deck and roofing membrane.
- C. Roof Tear-Off: Removal of existing membrane roofing system from deck.

- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Fastener pull-out test report.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data and Installer Certificates: See section 075323 ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING.
 - 1. Submit evidence of complying with requirements.
- B. Fastener pull-out test report.
- C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.
- D. Qualification Data: If encountered for, Installer including certificate that Installer is licensed to perform asbestos abatement and is approved by warrantor of existing roofing system.
- E. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestoscontaining material, by a landfill facility licensed to accept hazardous wastes.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of new membrane roofing system.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Roofing Tear-Off Conference: Conduct a conference at Project site.
 - 1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; deck Installer; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing system tear-off and replacement including, but not limited to, the following:

- a. Tear- Off and Roofing preparation, including membrane roofing system manufacturer's written instructions.
- b. Temporary protection requirements for existing roofing system that is to remain during and after installation.
- c. Existing roof drains and roof drainage during each stage of reroofing, and roof drain plugging and plug removal requirements.
- d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- e. Existing deck removal procedures and Owner notifications.
- f. Condition and acceptance of existing roof deck and vapor barrier substrate for reuse.
- g. Structural loading limitations of deck during reroofing.
- h. Vapor barrier flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect reroofing.
- i. HVAC shutdown and sealing of air intakes.
- j. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
- k. Discovery of asbestos-containing materials.
- 1. Governing regulations and requirements for insurance and certificates if applicable.
- m. Existing conditions that may require notification of Architect before proceeding.

1.8 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
 - 1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below the work area.
 - 2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below the affected area. Verify that occupants below the work area have been evacuated before proceeding with work over the impaired deck area.
- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
 - 1. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
 - 2. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's reference. Contractor is responsible for conclusions derived from existing documents.
- E. Limit construction loads on roof to 80 lb rooftop equipment wheel loads and 60 lb/sf for uniformly distributed loads.

- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
- G. Hazardous Materials: It is not expected that hazardous materials such as asbestos-containing materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- H. Roof Impact: Do not use impact tools or other vibration producing equipment on roof. Do not allow impact loads greater than 50 ft-lbs to strike the existing roof deck.
- I. Commence with Roof removal in test area indicated on drawings. Maintain watch on the underside of the test area roof deck during the process of roof removal and preparation. If visible damage to existing spray fireproofing occurs discontinue operation and notify the owner for further instruction.

1.9 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty. Notify warrantor before proceeding.

PART 2 - PRODUCTS

2.1 INFILL MATERIALS

A. Use infill materials matching existing membrane roofing system materials unless otherwise indicated.

2.2 TEMPORARY ROOFING MATERIALS

- A. Design layout for temporary roofing is responsibility of Contractor.
- B. See specification section 075323 ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING for temporary roofing materials.

2.3 AUXILIARY REROOFING MATERIALS

- A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new membrane roofing system.
- B. Metal Flashing Sheet: Metal flashing sheet is specified in Section 076200 "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect existing membrane roofing system.
 - 1. Loosely lay 1-inch minimum thick, molded expanded polystyrene (MEPS) insulation over the roofing membrane in areas indicated. Loosely lay 15/32-inch plywood or OSB panels over MEPS. Extend MEPS past edges of plywood or OSB panels a minimum of 1 inch.
 - 2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 - 3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
- B. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.
- E. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Remove amount of existing roofing and coordinate installation of membrane roofing system components so not left to be exposed to precipitation or left exposed at the end of the workday.
- C. Remove pavers and accessories from roofing membrane. Store and protect pavers and accessories for reuse. Discard cracked pavers.
- D. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.

- 1. Remove Existing Roofing System as indicated to include but not limited to; Pavers, LG board, Roof insulation, EPDM membrane roofing, Asphaltic roofing membrane and Substrate boards; down to metal or concrete deck.
- 2. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry. Remove unadhered bitumen and felts and wet felts.
- 3. Remove excess asphalt from steel deck. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
- 4. Remove fasteners from deck or cut fasteners off slightly above deck surface.

3.3 DECK PREPARATION

- A. Inspect deck after partial tear-off of membrane roofing system.
- B. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture on concrete deck by plastic sheet method according to ASTM D 4263 at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if moisture condenses under the plastic sheet or if asphalt test sample foams or can be easily and cleanly stripped after cooling.
- C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.
- D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.4 INFILL MATERIALS INSTALLATION

- A. Immediately after removal of selected portions of existing roofing system, inspected and repair, if needed, of deck, fill in the tear-off areas to match roofing system construction.
 - 1. Installation of infill materials is specified in Section 033053 Miscellaneous Cast-In-Place Concrete and 053100 Steel Decking."
 - 2. Install new roofing membrane patch over roof infill area. If new roofing membrane is installed the same day tear-off is made, roofing membrane patch is not required.

3.5 TEMPORARY ROOFING MEMBRANE (Vapor Barrier)

- A. Install approved temporary roofing membrane over area to be reroofed.
- B. Prepare the temporary roof to receive new roofing membrane. Restore temporary roofing membrane to watertight condition. Obtain approval for temporary roof substrate from roofing membrane manufacturer and Architect before installing new roof.

3.6 EXISTING BASE FLASHINGS

A. Remove existing base flashings around parapets, curbs, walls, and penetrations.

- 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Remove existing parapet sheathing and replace with new exterior fire-retardant-treated plywood sheathing. If parapet framing has deteriorated, immediately notify Architect.
- C. Plywood parapet sheathing is specified in Section 061053 Miscellaneous Rough Carpentry."

3.7 FASTENER PULL-OUT TESTING

- A. Perform or retain independent testing and inspecting agency to conduct fastener pull-out tests according to SPRI FX-1, and submit test report to Architect before installing new membrane roofing system.
- B. Obtain Architect's approval to proceed with specified fastening pattern where requried. Architect may furnish revised fastening pattern commensurate with pull-out test results. SUBSTRATE BOARD INSTALLATION
- C. Install substrate boards on concrete under temporary roofing membrane with long joints in continuous straight lines and end joints staggered between rows. Loosely butt subtrate boards together and fasten to deck.
 - 1. Tape joints of recover boards if required by roofing membrane manufacturer.
- D. Fasten substrate boards to resist wind-uplift pressure at corners, perimeter, and field of roof.

3.8 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - 1. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150.19

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket insulation.
 - 2. Mineral-wool blanket insulation.
 - 3. Spray polyurethane foam insulation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CertainTeed Corporation.
 - 2. Johns Manville.
 - 3. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
 - 1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
 - 2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.2 MINERAL-WOOL BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Fibrex Insulations Inc.
 - 2. Owens Corning.
 - 3. Thermafiber.

B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.3 SPRAY POLYURETHANE FOAM INSULATION

- A. Closed-Cell Polyurethane Foam Insulation Fire-Retardant: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. BaySystems NorthAmerica, LLC.
 - c. Dow Chemical Company (The).
 - d. ERSystems, Inc.
 - e. Gaco Western Inc.
 - 2. Minimum density of 1.5 lb/cu. ft., thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F.

2.4 VAPOR RETARDERS

- A. Fire-Retardant, Reinforced-Polyethylene Vapor Retarders: Two outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nonwoven grid of nylon cord or polyester scrim and weighing not less than 22 lb/1000 sq. ft., with maximum permeance rating of 0.1317 perm and with flame-spread and smoke-developed indexes of not more than 5 and 60, respectively, per ASTM E 84.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Raven Industries Inc.; DURA-SKRIM 2FR.
 - b. Reef Industries, Inc.; Griffolyn T-55 FR.
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- C. Vapor-Retarder Fasteners: Pancake-head, self-tapping steel drill screws; with fender washers.
- D. Single-Component Nonsag Urethane Sealant: ASTM C 920, Type I, Grade NS, Class 25, Use NT related to exposure, and Use O related to vapor-barrier-related substrates.
- E. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

2.5 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Gemco; Spindle Type.
 - 2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.
- B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Gemco; 90-Degree Insulation Hangers.
 - 2. Angle: Formed from 0.030-inch- thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 - 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.
- C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanizedsteel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AGM Industries, Inc.; RC150.
 - b. Gemco; R-150
- D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AGM Industries, Inc.; TACTOO Adhesive.
 - b. Gemco; Tuff Bond Hanger Adhesive.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsolled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 - 4. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward as indicated on Drawings.
- C. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and

electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

- D. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 INSTALLATION OF CURTAIN-WALL INSULATION

- A. Install glass-fiber blanket insulation in curtain-wall construction where indicated on Drawings.
 - 1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated between insulation and glass.
 - 2. Install insulation where it contacts perimeter fire-containment system to prevent insulation from bowing under pressure from perimeter fire-containment system.

3.5 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two framing members.
 - 1. Fasten vapor retarders to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
 - 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
 - 3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.6 **PROTECTION**

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes water-drainage exterior insulation and finish system (EIFS) applied over water-resistive coating over sheathing.

1.2 PERFORMANCE REQUIREMENTS

- A. Class PB EIFS: Physical properties and structural performance that comply with ICC-ES AC235 and ANSI/EIMA 99-A.
 - 1. Drainage: According to ICC-ES AC24.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and component of EIFS indicated.
 - 1. Various Sources Using Small-Scale Environmental Chambers."
- B. Shop Drawings: For EIFS. Include plans, elevations, sections, details of components, details, penetrations, terminations, joints, fasteners, and attachments to other work.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Material or product certificates.
- B. Product test reports.
- C. Field quality-control reports and special inspection reports.
- D. Evaluation reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An installer who is certified in writing by EIFS manufacturer as qualified to install manufacturer's system using trained workers.

- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.
- C. Fire-Test-Response Characteristics: Provide EIFS and system components with the following fire-test-response characteristics as determined by testing identical EIFS and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Characteristics: Per ASTM E 119.
 - 2. Full-Scale Multistory Fire Test: Per UBC Standard 26-4.
 - 3. Full-Scale Diversified Fire Test: Per ASTM E 108 modified for testing vertical walls.
 - 4. Intermediate-Scale Multistory Fire Test: Per NFPA 285 or UBC Standard 26-9.
 - 5. Radiant Heat Exposure: No ignition of EIFS per NFPA 268.
 - 6. Potential Heat: Acceptable level per NFPA 259.
 - 7. Surface-Burning Characteristics: Insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84 or UBC Standard 8-1.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution and set quality standards for fabrication and installation.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Dryvit Systems, Inc.
 - 2. Senergy; Degussa Wall Systems, Inc.
 - 3. Sto Corp.

2.2 MATERIALS

- A. Compatibility: Provide water-resistive coating, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and with substrates and approved for use by EIFS manufacturer for Project.
- B. Colors, Textures, and Patterns of Finish Coat: Match existing building.

- C. Plywood Wall Sheathing:
 - 1. Fasteners: Wafer-head or hard-roc steel drill screws complying with ASTM C 954, with an organic-polymer coating or other corrosion-protective coating having a salt-spray resistance of more than 500 hours per ASTM B 117.
- D. Water-/Weather-Resistive Barrier: Provide the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), without perforations.
- E. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water/weather-resistive barriers, compatible with substrate, and complying with physical and performance criteria of ICC-ES AC209.
 - 1. VOC Content of Coatings Used as Insulation Adhesive: 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Low-Emitting Coatings Used as Insulation Adhesive: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- F. Flexible-Membrane Flashing: Cold-applied, fully self-adhering, self-healing, rubberizedasphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
- G. Drainage Mat: Three-dimensional, nonwoven, entangled filament, nylon or plastic mat designed to drain incidental moisture by gravity; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard corrosion-resistant mechanical fasteners suitable for intended substrate.
- H. Spacers: Closed-cell polyethylene furring strips; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard corrosion-resistant mechanical fasteners suitable for intended substrate.
- I. Insulation Adhesive: Standard formulation that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- J. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; EIFS manufacturer's requirements; and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board."
 - 1. Flames-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
 - 2. Dimensions: Provide insulation boards not more than 24 by 48 inches and in thickness indicated but not more than 4 inches thick or less than that allowed by EIFS manufacturer.

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- K. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh; complying with ASTM D 578 and the following:
 - 1. High-Impact Reinforcing Mesh: Not less than 15 oz./sq. yd.
 - 2. Strip Reinforcing Mesh: Not less than 3.75 oz./sq. yd.
 - 3. Detail Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
 - 4. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd.
- L. Base-Coat Materials: EIFS manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials:
 - 1. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, natural color; clean, washed, silica sand complying with ASTM C 897 and EIFS manufacturer's requirements; alkali-resistant chopped glass fibers; and polymer-emulsion admixture for base-coat use.
- M. Primer: Factory-mixed, elastomeric-polymer primer.
- N. Polymer-Modified Portland Cement Finish-Coat Materials: Factory-blended formulation of portland cement, lime, natural color or white; natural sand aggregate and EIFS manufacturer's requirements; color-fast mineral pigments; and EIFS manufacturer's standard polymer-emulsion admixture for finish-coat use.
 - 1. Factory-mixed, based coating with enhanced mildew resistance.
 - 2. Colors: Match existing installation.
- O. Mechanical Fasteners: EIFS manufacturer's standard corrosion-resistant fasteners complete with standard washer attachments; selected for properties of pullout, tensile, and shear strength required to resist design loads of application indicated; capable of pulling fastener head below surface of insulation board; and of the following description:
 - 1. For attachment to steel framing members, provide steel drill screws complying with ASTM C 1002, Type W.
- P. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written requirements, manufactured from zinc alloy and complying with ASTM C 1063. Coordinate depth of accessories with thickness of base and finish coats required.
 - 1. Control Joints: Prefabricated one-piece type manufactured with expanded metal flanges, formed to provide double-keying action with protective coating, extending only to face of insulation, with removable tape on plaster face, and 1/4-inch joint sightline and bellows configuration as indicated below:
 - a. Deep Configuration: Bellows extends beyond finish coat to a depth of 3/4 inch past face of flanges.
 - 2. Casing Bead: Prefabricated one-piece type for attachment to surface of insulation or behind insulation, of depth required to suit thickness of coating and, where attached behind insulation, thickness of insulation.

2.3 ELASTOMERIC SEALANTS

- A. Elastomeric Sealant Products: Provide EIFS manufacturer's listed and recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in EIMA's "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems, Class PB" and with requirements in Division 7 Section "Joint Sealants" for products corresponding to description indicated below:
 - 1. Low-modulus, multicomponent, nonsag urethane sealant.
- B. Preformed Foam Sealant Products: Provide sealant compatible with adjacent materials.
- C. Sealant Color: As selected by Architect from manufacturer's full range.

2.4 MIXING

A. General: Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of EIFS.
- B. Examine roof and wall edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind EIFS and deterioration of substrates.

3.3 EIFS INSTALLATION

- A. General: Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.
- B. Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.
- C. Water-Resistive Coatings: Apply over substrates to protect substrates from degradation and to provide water-/weather-resistive barrier.
- D. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where indicated by EIFS manufacturer's written instructions to protect wall assembly from degradation. Prime substrates, if required, and install flashing to comply with EIFS manufacturer's written instructions and details.
- E. Trim: Apply trim accessories as required.
- F. Drainage Mat: Apply wrinkle free, continuously, with edges adhesively secured over water-/weather-resistive barrier according to manufacturer's written instructions.
- A. Board Insulation: Mechanically attach to substrate by method complying with EIFS manufacturer's written requirements. Install top surface of fastener heads flush with plane of insulation.
 - 1. Install fasteners into or through substrates with the following minimum penetration:
 - a. Steel Framing: 5/16 inch.
 - 2. Space fasteners as indicated below:
 - a. Vertically: Not more than 12 inches o.c. or more than 12 inches from bottom edge of starting course of insulation board.
 - b. Horizontally: Not more than 16 inches o.c.
 - 3. Apply insulation over dry substrates in courses with long edges of boards oriented horizontally. Begin first course from a level base line and work upward.
 - 4. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints so no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings.
 - a. Offset joints of insulation boards not less than 4 inches from joints in sheathing.
 - 5. Interlock ends at internal and external corners.
 - 6. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.

- 7. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
- 8. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/16 inch from surface of insulation and to remove yellowed areas due to sun exposure; smooth surface film created by extrusion process; do not create depressions deeper than 1/16 inch.
- 9. Interrupt insulation for expansion joints where indicated.
- 10. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
- 11. Treat exposed edges of insulation board to comply with EIFS manufacturer's written instructions.
- 12. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and EIFS protective coating lamina.
- B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, where expansion joints are indicated in substrates behind EIFS; where EIFS adjoin dissimilar substrates, materials, and construction;
- C. Base Coat: Apply to exposed surfaces of insulationin minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16-inch (1.6-mm) dry-coat thickness.
- D. Reinforcing Mesh: Completely embed mesh in wet base coat, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
 - 1. High-impact reinforcing mesh.
- E. Finish Coat: Apply over dry primed base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
 - 1. Texture: Match exisitng.
- F. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.

3.4 INSTALLATION OF JOINT SEALANTS

- A. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements in EIMA's "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems, Class PB."
 - 1. Clean surfaces to receive sealants to comply with indicated requirements and EIFS manufacturer's written instructions.
 - 2. Apply primer recommended in writing by sealant manufacturer for surfaces to be sealed.
 - 3. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.

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- 4. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints, without disturbing joint seal.
- 5. Recess sealant sufficiently from surface of EIFS so an additional sealant application, including cylindrical sealant backing, can be installed without protruding beyond EIFS surface.
- 6. Apply joint sealants after base coat has cured but before applying finish coat.

3.5 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer and EIFS manufacturer, that ensure that EIFS are without damage or deterioration at time of Substantial Completion.

3.6 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. According to ICC-ES AC24.
- B. EIFS Tests and Inspections: For the following:
 - 1. According to ICC-ES AC24.
- C. Remove and replace EIFS where test results indicate that EIFS do not comply with specified requirements.
- D. Prepare test and inspection reports.

END OF SECTION 072419

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Weather-Resistive Barrier and Rainscreen Underlayment.
 - 2. Flexible Flashing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESITIVE BARRIER (WB)

- A. Manufacture and Products:
 - 1. VaproShield, WallShield Water-Resistive Barrier and Rainscreen Underlayment. VaproShield LLC.; Gig Harbor, WA, (866)731-7663, Email: info@VaproShield.com, Website: www.vaproshield.com.

2.1 ACCESSORIES

- A. General: Provide manufacturer's rainscreen design components and flashing elements for a complete, weather-tight, ventilated wall installation.
- B. Flashing and Lap Tapes: Self-adhering single- and double- sided adhesive flashing, lap, and transition tapes, as recommended by manufacturer for application.
 - 1. Single-Sided Tape: 20 mil by 3 inch wide lap and edge tape.
 - 2. Double-Sided Tape: 30 mil by 1 inch wide lap tape.
 - 3. UV-Resistant Black Tape: 35 mil by 4 inch wide exposed open joint tape.
 - 4. Aluminized Tape: 20 mil by 4.5 inch and 9 inch, UV stable, moisture-resistant, and selfpriming flashing and transition tape.
- C. Stainless steel nails, staples, or screws used in conjunction with manufacturer's spray adhesive, as appropriate for substrate.

2.2 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Self-adhesive butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Grace Construction Products, a unit of W. R. Grace & Co. Conn.; Vycor Butyl Self Adhered Flashing.
 - b. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

- A. Cover sheathing with water-resistive barrier as follows:
 - 1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansionor control-joint locations.
 - 2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap unless otherwise indicated.
- B. General: Install water-resistive barrier in accordance with manufacturer's instructions. Secure water-resistive barrier to substrate to prevent damage prior to installation of cladding.
- C. Louver Openings
 - 1. Secure water-resistive barrier corners at sill of opening.
 - 2. Install lap strip of water-resistive barrier across sill and secure with tape or mechanical fasteners, leaving bottom of lap strip free to overlap water-resistive barrier minimum of 6 inches.
 - 3. Install lap strip water-resistive barrier around jambs, extending along wall surface a minimum of 9 inches.
 - 4. Secure prefabricated water-resistive barrier corners at head of opening.
 - 5. Install lap strip of water-resistive barrier across head of opening, extending horizontally beyond corners minimum of 6 inches.
 - 6. Cut water-resistive barrier along leading edge of header 2 inches beyond jamb to allow insertion of window nailing flange behind weather barrier.
- D. Door Openings
 - 1. Install water-resistive barrier lap strip around jambs, extending along wall surface a minimum of 9 inches.
 - 2. Secure prefabricated water-resistive barrier corners at head of opening.
 - 3. Install lap strip of water-resistive barrier across head of opening, extending horizontally beyond corners minimum of 6 inches.
 - 4. Cut water-resistive barrier along leading edge of header 2 inches beyond jamb to allow insertion of door nailing flange behind weather barrier.

- E. Pipe and Conduit Penetrations
 - 1. Install manufactured penetration sleeves sized for penetration and installed as recommended by sleeve manufacturer.
 - 2. Prepare water-resistive barrier skirt with minimum 12 inches of fabric on all sides at counter-flashed penetrations. Make multiple cuts to form a star-shaped opening in fabric and place over penetration. Extend skirt fabric along penetrating item and seal to penetrating item with single-sided tape.
- F. Water-Resistive Barrier
 - 1. Begin water-resistive barrier installation at bottom of wall, mechanically fastening waterresistive barrier at bottom and top at 24 inches (600 mm) o.c. Seal bottom edge of waterresistive barrier to substrate in continuous bead of non-skinning butyl sealant or butyl tape.
 - 2. Install water-resistive barrier at overlapped lap strips and penetration skirts. Overlap at vertical laps minimum of 6 inches (150 mm) with taped joints or 12 inches (300 mm) without tape. Overlap at horizontal laps minimum of 6 inches (150 mm). Insert water-resistive barrier under bottom edge of lap strips and penetration skirts; do not tape bottom edge of skirts and lap strips.
 - 3. Extend water-resistive barrier 6 inches (150 mm) over corners.
 - 4. Shingle subsequent courses of water-resistive barrier. Do not place vertical laps above openings.
 - 5. Use additional mechanical fasteners in field of sheet and tape joints if water-resistive barrier will be left exposed prior to installation of cladding.

3.2 PROTECTING AND CLEANING

- A. Protect installed water-resistive barrier from damage due to construction activities, high wind conditions, and extended exposure to weather.
- B. Inspect exposed water-resistive barrier prior to installation of cladding. Remove water-resistive barrier materials that have been damaged and replace. Patch damaged areas as recommended by manufacturer.

3.3 FLEXIBLE FLASHING INSTALLATION

- A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
 - 1. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
 - 2. Lap flashing over water-resistive barrier at bottom and sides of openings.
 - 3. Lap water-resistive barrier over flashing at heads of openings.

END OF SECTION 072500

SECTION 074213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Exposed-fastener, lap-seam metal wall panels.
 - 2. Conceal-fastener, lap-seam metal soffit panels.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal panel assembly during and after installation.
 - 8. Review of procedures for repair of metal panels damaged after installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
 - 1. Include Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:
 - 1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

- 1. Build mockup of typical metal panel assembly [as shown on Drawings] <Insert size>, including [corner,] [soffits,] supports, attachments, and accessories.
- 2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
- 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.
- E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.

- b. Deterioration of metals and other materials beyond normal weathering.
- 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: 110 mph.
 - 2. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft.
- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- F. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANEL

- A. General: Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
- B. Vee-Rib-Profile, Exposed-Fastener Horizontal Metal Wall Panels (MET-1): Formed with raised, V-shaped ribs and recesses that are approximately same size, evenly spaced across panel width, and with rib/recess sides angled at approximately 45 degrees.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide CENTRIA Architectural Systems "Style Rib" or comparable product by one of the following:
 - a. Morin; a Kingspan Group company.
 - b. Centria Architectural Systems.
 - c. Industrial Building Panels.
 - 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M,. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 0.036 inch
 - b. Exterior Finish: Two-coat fluoropolymer.
 - c. Color: Match existing building panel color.
 - 3. Rib Spacing: 7.2 inches o.c.
 - 4. Panel Coverage: 36 inches.
 - 5. Panel Height: 1.5 inches.

2.3 CONCEALED-FASTENER, LAP-SEAM METAL SOFFIT PANEL

- A. General: Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile, Concealed-Fastener Metal Wall Panels (MET-2): Formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide AEP Span; a BlueScope Steel company, Prestige:
 - a. AEP Span; a BlueScope Steel company
 - b. Morin; a Kingspan Group company.

- c. Centria Architectural Systems
- d. Industrial Building Products
- 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 0.034 inch
 - b. Surface: Smooth, flat finish; with one intermediate reverse rib.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: Match existing wall panel color.
- 3. Panel Coverage: 12 inches
- 4. Panel Height: 1.5 inches

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Concealed Panel Clips:
 - a. Fabricate from galvanized steel.
 - b. Provide panel system manufacturer's standard type clips to suit project requirements, including but not limited to the following:
 - c. Live loads.
 - d. Thermal movement; accommodate expansion and contraction without introducing stress into panel system.
 - e. Slope of panels.
 - f. Special conditions at transitions, penetrations, and terminations.
 - 2. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 - 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 4. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
 - 1. Fasteners:
 - a. Threaded fasteners general: Provide manufacturer's stainless steel fasteners of size and type required for intended application.
 - b. Use of cadmium-plated fasteners is not allowed.
 - 2. Rivets: Noncorrosive metal, compatible with metals to be fastened.
 - a. Aluminum rivets may be used only for fastening aluminum to aluminum; use stainless steel for fastening aluminum to other metals.
 - 3.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.
- F. Accessories:
 - 1. Sheet metal closures, flashing, corner and custom edge trim. Fabricate from same type of sheet metal, and with same finish, as adjacent panel.
 - 2. Flexible sheet flashing: Neoprene or EPDM sheet, minimum 0.060 inch thickness.
 - 3. Profile closures: Precut closed cell rubber.

2.5 MISCELLANEOUS METAL FRAMING

- A. Subgirts: C- or Z-shaped sections fabricated from 0.0598-inch bare steel thickness, galvanized, Class G90, minimum, cold-formed, metallic-coated steel sheet.
- B. Zee Clips: 0.079-inch bare steel thickness, cold-formed, galvanized, Class G90, minimum, steel sheet.
- C. Base or Sill Angles and Channels: 0.079-inch bare steel thickness, cold-formed, galvanized steel sheet, galvanized, Class G90, minimum.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

- 1. Minimum Base Metal Thickness: .0359 minimum.
- 2. Galvanized, Class G90, minimum.
- 3. Depth: As indicated.
- E. Cold-Rolled Furring Channels: 0.0538-inch bare steel thickness, with minimum 1/2-inch-wide flange.
 - 1. Depth: 1-1/2".
 - 2. Galvanized, Class G90, minimum.
 - 3. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch.
 - 4. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inchdiameter wire, or double strand of 0.0475-inch- diameter wire.
- F. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0359 inch minimum, and depth required to fit insulation thickness indicated.
 - 1. Galvanized, Class G90, minimum.
- G. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
 - 1. Galvanized, Class G90, minimum.

2.6 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

- 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flatlock seams. Tin edges to be seamed, form seams, and solder.
- 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
- 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
- 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.7 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Aluminum Panels and Accessories:
 - 1. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

- 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

- 1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
- 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
- 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
- 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
- 5. Flash and seal panels with weather closures at perimeter of all openings.
- E. Watertight Installation:
 - 1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
 - 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - 3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
 - 1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

A. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
- D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 075323.01 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**

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

1.2 **SUMMARY**

- Section Includes: A.
 - Fully Adhered EPDM membrane roofing system. 1.
 - Vapor Barrier. 2.
 - Roof insulation. 3
- B. **Related Sections:**
 - Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking. 1.
 - Section 070150.19 "Preparation for Re-Roofing" for removal of existing and temporary 2. roof beneath membrane roofing.
 - Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal 3. flashing; and miscellaneous sheet metal trim and accessories.
 - 4.
 - Section 077100 "Roof Specialties" for roof edge: and flashings and counterflashings. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof 5. hatches, vents, and other manufactured roof accessory units.

DEFINITIONS 1.3

Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and A. Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7 to loads as required to meet the design wind loads

- FM Approvals Listing: Provide membrane roofing, base flashings, and component materials D. that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals' markings.
 - 1. Fire/Windstorm Classification: Class 1A-105.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- Shop Drawings: For roofing system. Include plans, elevations, sections, details, and B. attachments to other work.
 - 1. Base flashings and membrane terminations.
 - Tapered insulation, including slopes. 2.
 - Roof plan showing orientation of steel roof deck and orientation of membrane roofing and 3. fastening spacings and patterns for mechanically fastened membrane roofing.
 - Insulation fastening patterns for corner, perimeter, and field-of-roof locations. 4.
- Samples for Verification: For the following products, in manufacturer's standard sizesor larger C. as follows:
 - 12-by-12-inch square sheet roofing, of color specified, including T-shaped side and end 1. lap seam.
 - 2.
 - 12-by-12-inch square Roof insulations. 12-by-12-inch square Walkway pads or rolls. 3.
 - 12-inch Termination bars. 4.
 - 12 x 6 length of clad metal flashing 5.
 - Six insulation fasteners of each type, length, and finish. 6.
 - Six roof cover fasteners of each type, length, and finish. 7.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and manufacturer.
- B. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- C. Manufacturer Certificate: Signed by roofing manufacturer certifying that membrane roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of complying with performance requirements.
- Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer D. and witnessed by a qualified testing agency, for components of membrane roofing system.

- E. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.
- F. Field quality-control reports.
- G. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For membrane roofing system to include in maintenance manuals.
- B. Warranties: Special warranties specified in this Section.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. Source Limitations: Obtain components including but not limited to; roof insulation, fasteners, metal edge; for membrane roofing system from same manufacturer as membrane roofing.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 - 1. Meet with Owner, Architect, Mechanical and Electrical Engineers; Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements for deck substrate conditions and finishes, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

- 7. Review governing regulations and requirements for insurance and certificates if applicable.
- 8. Review temporary protection requirements for roofing system during and after installation.
- 9. Review roof observation and repair procedures after roofing installation.
- G. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 7. Review governing regulations and requirements for insurance and certificates if applicable.
 - 8. Review temporary protection requirements for roofing system during and after installation.
 - 9. Review roof observation and repair procedures after roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof membrane, roof insulation, fasteners, composite cover boards, substrate board, vapor barrier, edge metal, insulation adhesive, roofing accessories, walkway products and other components of membrane roofing system.
 - 2. Warranty includes coverage for roof membrane installed at existing roof deck slopes.
 - 3. Wind Warranty: Include coverage for damage to membrane roofing system for wind and wind pressures up to the design values indicated.
 - 4. Warranty Period: 30 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

- A. Cured, non-reinforced EPDM membrane with a 55 mil fleece bonded to the underside. Meets the requirements of ASTM D 4637 Type I.
- Base of design shall be: Carlisle SynTec Incorporated, Sure-Seal FleeceBACK EPDM Membrane, PO Box 7000, Carlisle, PA 17013, 800-453-2554 – ext 7021: fax 717-245-7143, www.carlisle-syntec.com. Manufacturers Representative – Coastal Specified Products – Pacific Northwest Division – 800-645-5330.
 - 1. Architect knows of no other manufactures
 - a. Other manufactures may be submitted for approval by addendum.
 - 2. Thickness: 145 mils, nominal
 - a. 90 mils for Roof Membrane over 55 mils for FleeceBack

- 2. Sheet Dimensions:
 - a. Width: 10 feet maximum.
 - b. Length: 100 feet maximum.
- 3. Performance:
 - a. Breaking Strength: 200 lbf minimum.
 - b. Tear Strength: 45 lbf minimum.
 - c. Elongation: 480 percent.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
 - 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Gypsum Board and Panel Adhesives: 50 g/L.
 - c. Multipurpose Construction Adhesives: 70 g/L.
 - d. Fiberglass Adhesives: 80 g/L.
 - e. Single-Ply Roof Low VOC Membrane Adhesives: 250 g/L.
 - f. Single-Ply Roof Membrane Sealants: 450 g/L.
 - g. Nonmembrane Roof Sealants: 300 g/L.
 - h. Sealant Primers for Nonporous Substrates: 250 g/L.
 - i. Sealant Primers for Porous Substrates: 775 g/L.
 - j. Other Adhesives and Sealants: 250 g/L.
 - 3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.
- C. Protection Sheet: Epichlorohydrin or neoprene non-reinforced flexible sheet, 55- to 60-milthick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.
- D. Bonding Adhesive: Manufacturer's Low VOC.
- E. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.

- F. Lap Sealant: Manufacturer's standard, single-component sealant[, colored to match membrane roofing.
- G. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- H. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- I. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosionresistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.
- J. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.3 TAPERED INSULATION AND FLUTE FILLER

- A. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation meeting ASTM C 578. Carlisle Sure-Seal.
 - 1. Density: 1.25 lbs min.

2.4 INSULATION AND MEMBRANE ADHESIVE

A. Sure-Seal FAST 100 LV Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, or steel) or existing smooth surfaced BUR.

2.5 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, Type X, 5/8 inch thick.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - 2. Carlisle: Dens Deck Prime
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosionresistance provisions in FM Approvals 4470, designed for fastening substrate panel to roof deck.

2.6 VAPOR BARRIER (VB) Temporary Roof

- A. See Section 070150 "PREPARATION FOR RE-ROOFING".
- B. Composite: with maximum permeance rating of 0.05 perm.
 - 1. Products: Subject to compliance with requirements, provide the following:

- a. Carlisle: 725TR Self adhering Air and Vapor Barrier.
- 2. Adhesive: Manufacturer's standard lap adhesive, FM Approvals approved for vaporretarder application.
 - a. Carlisle: Cav-Grip Low-VOC Aerosol Contact Adhesive/Primer.

2.7 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured by EPDM membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.
- B. Polyisocyanurate Board Insulation (POLYISO): ASTM C 1289-06, Type II, Class 1, Grade 3,
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Carlisle: HP-H Flat Polyiso.
 - b. Thickness 2 inches
 - c. Below roof membrane and above tapered insulation
- C. Tapered Insulation (TAPERED): Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated, at contractors option.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Carlisle: HP-H Flat Polyiso.
 - b. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation meeting ASTM C 578. Carlisle Sure-Seal.
 - 1) Density: 1.25 lbs min.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, at contactors option.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Carlisle: HP-H Flat Polyiso.
 - b. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation meeting ASTM C 578. Carlisle Sure-Seal.
 - 1) Density: 1.25 lbs min.
- E. Composite Polyisocyanurate Board Insulation High Density Cover Board (COMPOSITE POLYISO): ASTM C 1289, Type II, Class 2, Grade 2, polymeric coated glass faced.
 - 1. Products: Subject to compliance with requirements, provide the following: a. Carlisle: SecurShield / SecurShield HD Composite.
 - 1. Base Layer -1-1/2" thick 20 psi
 - 2. Top Layer $\frac{1}{2}$ " 100 psi meeting ASTM D1621.

b. Total Thicknes - 2 inches

2.8 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosionresistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Bead-Applied Insulation Adhesive: Insulation manufacturer's recommended bead-applied, lowrise, one- or multicomponent urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- D. Full-Spread Applied Insulation Adhesive: Insulation manufacturer's recommended sprayapplied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- E. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application.

2.9 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway rolls, approximately 3/16 inch (5 mm) thick, and acceptable to membrane roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053100 "Steel Decking."
 - 4. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 5. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

- 6. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate installation of membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday, with roof tear-off.
- B. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- D. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 SUBSTRATE BOARD (Metal Deck)

- A. Adhere flute filler, substrate board, air and vapor barrier, and insulation to the roof deck for Adhered Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.
- B. Enhance the perimeter and corner areas in accordance with International Building Code (ASCE-7) or ANSI/SPRI WD-1.
- C. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

3.4 ADHESIVE PRIMER APPLICATION – (Concrete Deck or Substrate Board)

- A. Concrete Deck Preparation: The substrate must be completely dry. The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, laitance and form-release agents. Some curing compounds may interfere with proper adhesion, and an adhesion test is recommended. Adhesive primer shall be kept above 70°F prior to application. Apply adhesive only to those areas that will be covered with membrane the same day. Re-prime any areas that become wet or dirty. Spray specified adhesive primer at a rate of 2,000-2,500 sq. ft. per cylinder using a spray gun assembly. Dry time is approximately 5 10 minutes.
- B. Substrate Board Preparation: Apply adhesive only to those areas that will be covered with membrane the same day. Re-prime any areas that become wet or dirty. Spray specified adhesive primer at a rate of 2,000-2,500 sq. ft. per cylinder using a spray gun assembly. Dry time is approximately 5 10 minutes.

3.5 VAPOR-BARRIER INSTALLATION (Temporary Roof)

- A. Laminate Sheet: Install laminate-sheet vapor retarder in a single layer over area to receive vapor barrier open, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively. Bond vapor retarder to substrate as follows:
 - 1. Apply adhesive at rate recommended by vapor-retarder manufacturer. Seal T-joint step off laps with adhesive according to membrane manufacturer's written instructions. Vapor Barrier Installation: Vapor barrier material must be kept at temperatures above 70°F prior to installation and should be installed at temperatures above 40°F (air and substrate). Apply vapor barrier from low to high points, in a shingle fashion, so that the laps will shed water. Overlap all edges at least 2½". End laps should be staggered. Position membrane carefully to avoid fish-mouths and wrinkles. Roll the vapor barrier membrane immediately after installation with a 100-150-pound roller wrapped in a resilient material. Seaming Install a 2"-long bead of lap sealant internally along any T-joints or step-offs. Use a hand roller to mate the seam together, paying particular attention to the T-joints and step-offs. Membrane must be dry prior to installation of subsequent insulation layers.
- B. Completely seal vapor barrier at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.
- C. Flash penetrations and field-formed inside and outside corners.
- D. Install vapor barrier and auxiliary materials to tie in to existing membrane roofing to maintain weather-tightness of transition.

3.6 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install adhered insulation layers maximum 4 feet by 4 feet, applied with adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating.
- E. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller.
- F. Add temporary weight and use relief cuts to ensure boards are well adhered. under area of roofing to achieve required thickness.
- G. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

- 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- H. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- I. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- J. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Set each layer of insulation in full coverage ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place, or set each layer of insulation in a uniform coverage of full-spray insulation adhesive, firmly pressing and maintaining insulation in place.
- K. Install insulation cover board composite over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
 - 2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.7 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
- E. Fabric-Backed Membrane Adhesive: Apply to substrate at rate required by manufacturer and install fabric-backed membrane roofing.
- F. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeters.

- G. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- H. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping membrane roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of membrane roofing terminations.
- I. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- J. Spread sealant or mastic bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.
- K. Install membrane roofing and auxiliary materials to tie in to existing membrane roofing to maintain weather-tightness of transition.
- L. Adhere protection sheet over membrane roofing at locations indicated.
- 3.8 MEMBRANE SPLICING (Tape Splice)
 - A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
 - B. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.
 - C. Where splice tape is not factory-applied, apply splice tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch.
 - D. Remove the release film and press the top sheet onto the tape using hand pressure.
 - E. Roll the seam toward the splice edge with a 2 inch wide steel roller.
 - F. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide section of pressure-sensitive flashing or uncured flashing over all field splice intersections.
 - G. When using non-Pressure-Sensitive Elastoform Flashing, seal edges of flashings with Lap Sealant.
 - H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.
 - I. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
 - J. Spread sealant or mastic bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.
 - K. In-Splice Attachment: Secure one edge of membrane roofing using fastening plates or metal battens centered within membrane splice and mechanically fasten membrane roofing to roof deck. Field splice seam.

L. Install membrane roofing and auxiliary materials to tie in to existing roofing to maintain weather-tightness of transition.

3.9 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations indicated.
- B. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.10 DAILY SEALS

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.11 FIELD QUALITY CONTROL

- A. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion
- C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.12 PROTECTING AND CLEANING

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- C. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition

free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.13 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - Owner: <Insert name of Owner.> 1.
 - 2. Address: <Insert address.>
 - Building Name/Type: <Insert information.> Address: <Insert address.> 3.
 - 4.
 - 5. Area of Work: <Insert information.>
 - Acceptance Date: <Insert date.> 6.
 - Warranty Period: <Insert time.> 7.
 - Expiration Date: <Insert date.> 8.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- This Warranty is made subject to the following terms and conditions: D.
 - Specifically excluded from this Warranty are damages to work and other parts of the 1. building, and to building contents, caused by:
 - Lightning; a.
 - Peak gust wind speed exceeding 110 mph; b.
 - Fire: c.
 - Failure of roofing system substrate, including cracking, settlement, excessive d. deflection, deterioration, and decomposition;
 - Faulty construction of parapet walls, copings, chimneys, skylights, vents, e. equipment supports, and other edge conditions and penetrations of the work;
 - Vapor condensation on bottom of roofing; and f.
 - Activity on roofing by others, including construction contractors, maintenance g. personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 - 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

- 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
- 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
- 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
- 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
- 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.
 - 1. Authorized Signature: <Insert signature>.
 - 2. Name: <Insert name>.
 - 3. Title: <Insert title>.

END OF SECTION 075323.01 - ALTERNATE NO. 1

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Formed roof drainage sheet metal fabrications.
 - 2. Formed low-slope roof sheet metal fabrications.
 - 3. Formed wall sheet metal fabrications.
- B. Related Sections:
 - 1. Section 061035 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Membrane" for roofing membrane, substrate boards, vapor barrier, roof insulation, cover boards, and roofing accessories.
 - 3. Section 077100 "Roof Specialties" for manufactured roof edge, reglets and counterflashings.
 - 4. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
- C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identification of material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 4. Details of termination points and assemblies, including fixed points.
 - 5. Details of edge conditions and counterflashings as applicable.
 - 6. Details of special conditions.
 - 7. Details of connections to adjoining work.
 - 8. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches (1:5).
- C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
 - 3. Accessories and Miscellaneous Materials: Full-size Sample.
 - 4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified fabricator.
- B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- C. Copper Sheet Metal Standard: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof eave, including wall to roof, fascia, fascia trim, approximately 5 feet long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
 - 5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.9 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.
 - 1. Finish: 2D (dull, cold rolled).
 - 2. Surface: Smooth, flat.
- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
 - 2. Surface: Smooth, flat.
 - 3. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 4. Color: As selected by Architect from manufacturer's full range.
 - 5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.2 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

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2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - 2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.

- 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
- 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- J. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Fabricated Hanger Style: SMACNA figure designation 1-35C.
 - 2. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- B. Parapet Scuppers: Fabricate scuppers of dimensions required with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

- 1. Style: SMACNA similar to figure designation 1-26
- 2. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
- C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape indicated complete with outlet tubes, exterior flange trim, and built-in overflows.
 - 1. SMACNA figure designation 1-25C.
 - 2. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
- D. Splash Pans:

1.

- 1. Style: SMACNA figure designation 1-36
- 2. Fabricate from the following materials:
 - a. Aluminum: 0.040 inch thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on] interior leg. Miter corners, seal, and solder or weld watertight.
 - 1. Coping Profile Dual Wall: SMACNA figure designation 3-8A.
 - 2. Joint Style: Butt, with 12-inch- (300-mm-) wide, concealed backup plate and 6-inch-wide, exposed cover plates.
 - 3. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.040 inch thick.
- B. Roof and Roof to Wall Transition Expansion-Joint Cover: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.034 inch thick.
- C. Base Flashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
- D. Counterflashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- E. Flashing Receivers: Fabricate from the following materials:

Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

- F. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
- G. Roof-Drain Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.016 inch thick.

2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch- high, end dams where flashing is discontinuous. Fabricate from the following materials:
 - 1. Stainless Steel: 0.016 inch thick.
- B. Wall Expansion-Joint Cover: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing:
 - 1. Fabricate Pitch Pans Style: SMACNA figure designation 4-17E.
 - a. Base of reinstalled ladder but not limited to.
 - 2. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Install underlayment as indicated on Drawings.
- B. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.
- C. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- D. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - 5. Install sealant tape where indicated.
 - 6. Torch cutting of sheet metal flashing and trim is not permitted.
 - 7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
 - 1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

- 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch (19 mm) for wood screws and metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder metallic-coated steel and aluminum sheet.
 - 2. Pre-tinning is not required for zinc-tin alloy-coated stainless steel and zinc-tin alloy-coated copper.
 - 3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 - 4. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
 - 5. Copper Soldering: Tin edges of uncoated copper sheets using solder for copper.
- G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Downspouts: Join sections with 1-1/2-inch telescoping joints.

- 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
- 2. Provide elbows at base of downspout to direct water away from building.
- 3. Connect downspouts to underground drainage system indicated.
- C. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in elastomeric sealant compatible with roofing membrane.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
 - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 12-inch centers.
 - 2. Anchor interior leg of coping with screw fasteners and washers at 12-inch centers.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.7 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof-edge flashings.
 - 2. Reglets and Counterflashing
- B. Related Sections:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Membrane" for roofing membrane, substrate boards, vapor barrier, roof insulation, cover boards, and roofing accessories.
 - 3. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install roof-edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-105. Identify materials with FM Approvals' markings.
- C. SPRI Wind Design Standard: Manufacture and install roof-edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work. Include the following:
 - 1. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 2. Pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 3. Details of termination points and assemblies, including fixed points.
 - 4. Details of special conditions.
- C. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- D. Samples for Verification: For roof-edge flashings, roof-edge drainage systems, reglets and counterflashings made from 12-inch lengths of full-size components including fasteners, cover joints, accessories, and attachments.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for roof-edge flashings.
- B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof edge, including fascia, approximately 5 feet long, including supporting construction, seams, attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- B. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects roof specialties including installers of roofing materials and accessories.
 - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof specialties installation.

1.9 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXPOSED METALS

- A. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.
 - 1. Non-Patinated Exposed Finish: Mill.
 - 2. Pre-Patinated Copper-Sheet Finish: Pre-patinated according to ASTM B 882.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
 - 1. Surface: Smooth, flat finish.
 - 2. Exposed Coil-Coated Finishes: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- a. Two-Coat Fluoropolymer: AAMA 620. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
- b. Concealed Surface: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
- C. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:
 - 1. Exposed High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 2604. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.2 CONCEALED METALS

- A. Aluminum Sheet: ASTM B 209, alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- B. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slipresisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
 - 3. <u>Products</u>: Subject to compliance with requirements, provide the following:
 - a. <u>Carlisle Coatings & Waterproofing;</u> CCW WIP 300HT.
- C. Polyethylene Sheet: 10-mil-thick polyethylene sheet complying with ASTM D 4397.

D. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
 - 2. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
 - 3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
 - 4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 - 5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 ROOF-EDGE FLASHINGS

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous formed- or extruded-aluminum anchor bar with integral drip-edge cleat to engage fascia cover. Provide matching corner units.
 - 1. Basis-of-Design Product: Metal Era "Anchor Tite Fascia ", 7" 8-1/2" inch face, as indicated on drawings, with extruded aluminum back and .063 aluminum face or a comparable product by one of the following:
 - a. Carlisle Syntec
 - b. Firestone Building Products
 - c. Metal-Era, Inc.
 - 2. Fascia Cover: Fascia Cover: Fabricated from the following exposed metal:
 - a. Formed Aluminum: 0.063 inch thick or thickness as required to meet performance requirements whichever is greater.
 - 3. Fascia Accessories: Downspout scuppers with integral conductor head and downspout adapters and perforated screens.

- a. Scupper and Collector Head to be manufactured by roof edge system manufacturer, and fit integral to roof edge, with flanged back and stiffened top edge and of dimensions and shape required complete with outlet tubes, exterior flange trim, and built-in overflows, of color, material and general configuration to integrate with function of roof edge
- b. Fabricate collector heads from the same materials as preformed edge to include integral scupper flashing .Surfaces coming in contact with roofing, to be coated.

2.6 REGLETS AND COUNTERFLASHINGS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Fry Reglet Corporation SpringLok Surface Mounted Reglet with Counterflashing.
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products Inc.
 - d. Hickman, W. P. Company.
 - e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
 - f. Keystone Flashing Company, Inc.
- B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
 - 1. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
- C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal.
- D. Material: Galvanized steel, 0.022 inch thick.
- E. Accessories:
 - 1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 - 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- F. Finish: Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hotdip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
 - 2. Surface: Smooth, flat.
 - 3. Exposed Coil-Coated Finish:

- a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- 4. Color: As selected by Architect from manufacturer's full range.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- B. Self-Adhering Sheet Underlayment: Install wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water. Overlap edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
- C. Polyethylene Sheet: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

D. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise shown on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints with elastomeric sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches except reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for

copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 ROOF-EDGE FLASHING INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
 - 2. Loosely lock front edge of scupper with conductor head.
 - 3. Seal or solder exterior wall scupper flanges into back of conductor head.
- C. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.

3.6 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant. Fit counterflashings tightly to base flashings.

3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

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- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Roof hatches.
 - 4. Pipe supports.
- B. Related Sections:
 - 1. Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Membrane" for roofing membrane, substrate boards, vapor barrier, roof insulation, cover boards, and roofing accessories.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing; and miscellaneous sheet metal trim and accessories.
 - 3. Section 077100 "Roof Specialties" for manufactured roof edge, reglets and counterflashings.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roofmounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and temporary roofing to interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.8 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation and mill phosphatized for field painting where indicated.

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- 1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
- B. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
 - 1. Mill Finish: As manufactured.
- C. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.
- D. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.
- E. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- F. Steel Tube: ASTM A 500, round tube.
- G. Galvanized-Steel Tube: ASTM A 500, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- H. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness as indicated.
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Underlayment:
 - 1. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 - 2. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.
 - 3. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.
- F. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened.

Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

- 1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- 3. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
- 4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- G. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- H. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- I. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- J. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units with integral spring-type vibration isolators and capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Thybar Corporation TC-1 or comparable product by one of the following:
 - a. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - b. Pate Company (The).
 - c. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Material: Aluminum sheet, 0.090 inch thick.
 - 1. Finish: Mill.
- D. Construction:
 - 1. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
 - 2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 - 3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.

- 4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
- 5. Fabricate curbs to minimum height of 18 inch unless otherwise indicated.
- 6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
- 7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
- 8. Security Grille: Provide where indicated.

2.4 EQUIPMENT (PIPE & CONDUIT) SUPPORTS

- A. Equipment Supports: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Thybar Corporation Tems-3 or comparable product by one of the following:
 - a. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - b. Pate Company (The).
 - c. Roof Products, Inc.
 - d. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Material: Aluminum sheet, 0.090 inch thick.
 - 1. Finish: Two-coat fluoropolymer.
 - 2. Color: As selected by Architect from manufacturer's full range.
- D. Construction:
 - 1. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
 - 2. Liner: Same material as equipment support, of manufacturer's standard thickness and finish.
 - 3. Factory-installed continuous wood nailers 5-1/2 inches wide at tops of equipment supports.
 - 4. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
 - 5. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
 - 6. Fabricate equipment supports to minimum height of 18 inches unless otherwise indicated.
 - 7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate each support with height to accommodate roof slope so that tops of supports are level with each other. Equip supports with water diverters or crickets on sides that obstruct water flow.
 - 8. Security Grille: Provide where indicated.

2.5 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Bilco Type "E" or comparable product by one of the following:
 - a. Babcock-Davis.
 - b. Bilco Company (The).
 - c. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - d. Pate Company (The).
- B. Type and Size: Single-leaf lid, 36 by 36 inches.
- C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.
- D. Hatch Material: Aluminum sheet, 0.090 inch thick.
 - 1. Finish: Mill
- E. Construction:
 - 1. Insulation: Polyisocyanurate board.
 - 2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 - 3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
 - 4. Fabricate curbs to minimum height of 18 inches] unless otherwise indicated.
 - 5. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.
- F. Hardware: Stainless-steel spring latch with turn handles, pintle-type hinge system, and padlock hasps inside and outside.
 - 1. Provide two-point latch on lids larger than 84 inches.
 - 2. Provide remote-control operation.
- G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
 - 1. Height: 42 inches above finished roof deck.
 - 2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches in diameter or galvanized-steel tube, 1-5/8 inches in diameter.
 - 3. Flat Bar: Galvanized steel, 2 inches high by 3/8 inch thick.

- 4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches in diameter.
- 5. Chain Passway Barrier: Galvanized proof coil chain with quick link on fixed end.
- 6. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
- 7. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
- 8. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
- 9. Fabricate joints exposed to weather to be watertight.
- 10. Fasteners: Manufacturer's standard, finished to match railing system.
- 11. Finish: Manufacturer's standard.
 - a. Color: As selected by Architect from manufacturer's full range.
- H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
 - 1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
 - 2. Height: 42 inches above finished roof deck.
 - 3. Material: Stainless steel.
 - 4. Post: 1-5/8-inch- diameter pipe.
 - 5. Finish: Manufacturer's powder coat.
 - a. Color: As selected by Architect from manufacturer's full range.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of [uncoated aluminum] [stainless-steel] roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.
- E. Roof-Hatch Installation:
 - 1. Install roof hatch so top surface of hatch curb is level.
 - 2. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 - 3. Attach safety railing system to roof-hatch curb.
 - 4. Attach ladder-assist post according to manufacturer's written instructions.
- F. Equipment (Pipe & Conduit) Support Installation: Install supports so top surfaces are in contact with and provide equally distributed support along length of supported item.
- G. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions.
- H. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.

- B. Touch up factory-primed surfaces with compatible primer ready for field painting.
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 078100 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes sprayed fire-resistive materials (SFRM).
 - 1. Steel Structure
 - 2. Metal Deck
 - 3. Patching of Existing SFRM

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Evaluation reports.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.

SECTION 078100 – APPLIED FIREPROOFING

- C. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction. and the following VOC limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 150 g/L.
 - 3. Primers, Sealers, and Undercoaters: 200 g/L.
 - 4. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
- D. Low-Emitting Materials: Fireproofing used within the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. SFRM: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
 - 1. <u>Products</u>: Subject to compliance with requirements, provide one of the following:
 - a. <u>Grace, W. R. & Co. Conn.; Grace Construction Products;</u> Monokote MK-6 Series.
 - b. <u>Isolatek International</u>; Cafco Blaze-Shield II.
 - 2. Application: Designated for exterior use by a qualified testing agency acceptable to authorities having jurisdiction.
 - 3. Bond Strength: Minimum 430-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E 736.
 - 4. Density: Not less than 15 lb/cu. ft. and 22 lb/cu. ft. as specified in the approved fire-resistance design, according to ASTM E 605.
 - 5. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch.
 - 6. Combustion Characteristics: ASTM E 136.
 - 7. Surface-Burning Characteristics: Flame-spread and smoke-developed indexes of 10 or less according to ASTM E 84.
 - 8. Compressive Strength: Minimum 100 lbf/sq. in. according to ASTM E 761.
 - 9. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 - 10. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 - 11. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 - 12. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.
 - 13. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21 or rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273.

SECTION 078100 – APPLIED FIREPROOFING

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer.
- C. Bonding Agent: Product approved by fireproofing manufacturer
- D. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Spray apply fireproofing to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

SECTION 078100 - APPLIED FIREPROOFING

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as required by the IBC, 1704.10.
- B. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- C. Prepare test and inspection reports.

3.5 CLEANING AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Repair fireproofing damaged by other work before concealing it with other construction.
- C. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078100

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hollow-metal work.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required.
- E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Amweld International, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Commercial Door & Hardware Inc.
 - 4. Curries Company; an Assa Abloy Group company.
 - 5. Republic Doors and Frames.
 - 6. Steelcraft; an Ingersoll-Rand company.

2.2 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
 - 1. Physical Performance: Level A according to SDI A250.4.
 - 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Polyisocyanurate.
 - 3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 11 when tested according to ASTM C 1363.
 - 4. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
 - b. Construction: Full profile welded.
 - 5. Exposed Finish: Prime.

2.3 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inchdiameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.4 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

E. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

2.5 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - b. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

2.6 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Install frames with removable stops located on secure side of opening.
 - b. Install framesin existing steel subframes by light gauge welding with removable stops located on secure side of opening.
 - c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - d. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - e. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Retain first subparagraph below if permitted.
 - b. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Metal-Stud Partitions and Existing Steel Subframes: Solidly pack mineral-fiber insulation inside frames.
 - 4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in existing and those frames here-in specified, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: [3/4 inch] [5/8 inch] plus or minus 1/32 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division1 Specification Sections, apply to this section.
- 1.2 SUMMARY
 - A. Section Includes:
 - 1. Door and related hardware specified or indicated on drawings, include existing to be reinstalled to complete project.
 - B. Related Sections:
 - 1. Division 8 Section "Steel Doors and Frames".

1.3 **REFERENCES**:

- A. American National Standards Institute ANSI 156.18 Materials and Finishes.
- B. ANSI A117.1 Specifications for making buildings and facilities usable by physically handicapped people.
- C. ADA Americans with Disabilities Act of 1990
- D. BHMA Builders Hardware Manufacturers Association
- E. DHI Door and Hardware Institute
- F. NFPA National Fire Protection Association
- G. UL Underwriters Laboratories
- H. WHI Warnock Hersey Incorporated
- I. SDI Steel Door Institute
- J. NAAM National Association of Architectural Metal Manufacturers

1.4 SUBMITTALS & SUBSTITUTIONS

- A. Hardware Schedule: Submit for approval six copies of schedule per Division 1. Organize vertically formatted schedule into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
 - 1. Type, style, function, size, quantity and finish of hardware items.
 - a. Use BHMA Finish codes per ANSI A156.18.
 - 2. Name, part number and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set coordinated with floor plans and door schedule.
 - 5. Explanation of abbreviations, symbols, and codes contained in schedule.
 - 6. Mounting locations for hardware.

- 7. Door and frame sizes, materials, hand, rating, degrees of swing, and jamb depth.
- 8. List of manufacturers used and their nearest representative with address and phone number.
- 9. Catalog cuts.
- 10. Manufacturer's technical data and installation instructions for hardware, including electronic hardware.
- 11. Diagrams, templates or other information as required to assure coordination with Owner installed door security system.
- 12. Date of jobsite visit if existing conditions.
- B. Schedules in coded or horizontal format are unacceptable. Submittals not conforming to the above requirements will be returned without review, for re-submittal.
- C. Bid and submit manufacturer's updated/improved item if scheduled item is discontinued.
- D. Make substitution requests in accordance with Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.
 - 1. Items listed with no substitute manufacturers have been requested by OWNER to meet existing standard.
- E. Closeout Submittals: Furnish 5 copies of the as-built/as-installed hardware schedule with closeout documents including wiring diagrams, manufacturers installation instructions, and suppliers final inspection report.
- 1.4 QUALITY ASSURANCE:
 - A. Supplier Qualifications:
 - 1. Direct factory contract supplier who has been furnishing hardware in the projects vicinity for a period of not less then 5 years.
 - 2. Employs a certified architectural hardware consultant (AHC), available at reasonable times during course WORK for project hardware consultation to OWNER, ARCHITECT and Contractor. Responsible for detailing, scheduling and ordering of finish hardware.
 - 3. Supplier willing to agree in writing to maintain parts inventory of items supplied for future service to OWNER.
 - B. Hardware: New, free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.
 - C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
 - D. Notify ARCHITECT of any code conflicts before ordering material.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Delivery: coordinate delivery to appropriate locations (shop or field).

Permanent keys and cores: secured delivery direct to OWNER's representative.

- B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.
- C. Storage: Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

1.6 **PROJECT CONDITIONS:**

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to ARCHITECT's approval.

1.7 SEQUENCING AND COORDINATION:

- Reinforce walls. A.
- B. Coordinate finish floor materials and floor-mounted hardware.
- C. Furnish manufacturer templates to door and frame fabricators, including templates for Owner provided door security system.
- D. Use hardware consultant to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.
 - Confirm that door manufacturers furnish necessary UBC-7-2 compliant seal 1. packages.
- E. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

1.8 WARRANTY:

- Part of respective manufacturers' regular terms of sale. Provide manufacturers' A. warranties:
 - Ten years mechanical. 1. Closers: 2. Exit Devices:
 - Three years.
 - Life of Building. 3. Hinges:
 - Other Hardware: Two years. 4.

1.9 MAINTENANCE:

- A. Extra Materials: Provide extra materials ONLY as specified in a Misc.hardware set for future maintenance direct to OWNER.
 - 1. 1 each closer.
 - 2. 1 each lockset.
- B. Tools: After final adjustment of door hardware turn over to OWNER tools furnished during construction used for installation and adjustment.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS:
 - A. Listed are specified manufacturers and acceptable alternates:

ITEM:	MANUFACTURER:
Hinges	(HA) Hager

- B. Provide hardware items required to complete the work in accordance with these specifications and manufacturers' instructions.
 - 1. Include items inadvertently omitted from this specification at no additional cost to the project. Note these items in submittal for review.
 - 2. Where scheduled item is now obsolete, bid and furnish manufacturers updated item at no additional cost to the project.

2.2 HANGING MEANS:

- A. Conventional Hinges: Hinge open widths minimum, but, of sufficient throw to permit maximum door swing. Steel or stainless steel pins and concealed bearings.
 - 1. Three hinges per leaf to 7 foot, 6 inch height. Add one for each additional 30 inches in height, or any fraction thereof.
 - 2. Extra heavy weight hinges on doors over 3 foot 5 inches in width.
 - 3. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins. Pivot reinforced hinge type where specified.
 - 4. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
 - 5. Provide shims and shimming instructions for proper door adjustment.

2.3 LOCKSETS, LATCHSETS, DEADBOLTS:

- A. Cylinder Locksets and Latchsets:
 - 1. Chassis: cold-rolled steel, handing field-changeable without disassembly.
 - 2. Latchbolts: ³/₄ inch throw stainless steel anti-friction type.

- 3. Lever Trim: through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.
 - a. Spindles: security design independent break-away. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.
- 4. Deadbolts: stainless steel 1-inch throw.
- 5. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing. Where indicated, provide template to door frame mfr for electric strikes to be provided and installed by Owner.

2.4 CLOSERS

- A. Door Closers: Full rack and pinion type with removable non-ferrous cover. Provide sex bolts at all wood doors. Place closers inside building, stairs, and rooms. Closers shall be non-handed, non-sized and adjustable.
 - 1. Provide multi-size 1 through 6 at all doors rated or not.
 - 2. Flush transom offset brackets shall be used where parallel arm closers are required.
 - 3. Drop brackets are required at narrow head rails.
 - 4. Set exterior doors closers to have 8.5 lbs maximum pressure to open, interior non-rated at 5 lbs, rated openings at 12 lbs.

2.5 OTHER HARDWARE

- A. Flush Bolts: Low operating force design.
- B. Exit Devices: Furnish all sets at wood doors with sex bolts unless otherwise specified. Lever handle trim shall match locksets. All touch bar type devices shall have deadlocking latchbolt, stainless steel touchpads or vinyl covered pads and be non-handed. The unlatching force shall not exceed 15 pounds when applied in the direction of exit travel.
- C. Door Stops: Provide stops to protect walls, casework or other hardware.
 - 1. Unless otherwise noted in Hardware Sets, provide wall type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
- D. Seals: Finished to match adjacent frame color. Resilient seal material: solid high-grade neoprene. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability. Proposed substitutions: submit for approval.
 - 1. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.
 - 2. Non-corroding fasteners at in-swinging exterior doors.

- G. Thresholds: As scheduled. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.
 - 1. Exteriors: Set in full bed of butyl-rubber or polyisobutylene mastic sealant. Nonferrous ¹/₄ inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).
- H. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.
 - 1. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered prepunched silencer holes.

2.6 FINISH:

- A. Generally BHMA 630 (US32)26 Satin Stainless Steel
 - 1. Unless otherwise noted.
- B. Door closers: factory powder coated to match other hardware, unless otherwise noted.
 - 1. Provide satin-chrome plated arms, tracks and covers where scheduled bright metallic powder coat (789 MTLPC) not available.
- C. Aluminum items: match predominant adjacent material. Seals to coordinate with frame color.

2.7 KEYING REQUIREMENTS:

- A. Key System: Key to the existing Corbin Russwin Master Key System. Confirm with owner proper keyway, key quantities and submit key schedule for approval before ordering.
 - 1. Provide cylinders and keys furnished with visual key control with code stamped on back of each cylinder and the face of each key.
 - 2. Provide 6 pin cylinders for locks or scheduled items requiring cylinders for proper operation.
 - 3. Construction key all locks.
 - 4. Provide the following keys:
 - 1. 10 construction keys
 - 2. 6 Master keys
 - 3. 3 keys per lock

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

- A. Factory trained, certified, and carries a factory-issued card certifying that person as a "Certified Installer". Alternative: can demonstrate suitably equivalent competence and experience.
- 3.2 PREPARATION:
 - A. Ensure that walls and frames are square and plumb before hardware installation.
 - B. Clarify placement if new hardware is to be installed near existing doors/hardware scheduled to remain.
 - C. Mounting Heights: Locate hardware units at heights indicated in DHI's recommended locations unless otherwise indicated below or required to comply with governing regulations.

3.3 INSTALLATION

- A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.
 - 1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
 - 2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
- B. Locate floor stops not more than 4 inches from the wall.
- C. Drill pilot holes for fasteners in wood doors and/or frames.
- D. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to OWNER items not scheduled for reuse.

3.4 ADJUSTING

- A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
 - 1. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to OWNER's satisfaction.
- B. Inspection: Use hardware supplier. Include suppliers with closeout documents.

- C. Follow-up inspection: Installer to provide letter of agreement to OWNER that approximately 6 months after substantial completion, installer will visit Project with representatives of the manufacturers of the locking devices and door closers to accomplish following:
 - 1. Re-adjust hardware.
 - 2. Evaluate maintenance procedures and recommend changes or additions, and instruct OWNER's personnel.
 - 3. Identify items that have deteriorated or failed.
 - 4. Submit written report identifying problems and likely future problems.

3.5 PROTECTION/CLEANING:

- A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.
- B. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

3.6 SCHEDULE OF FINISH HARDWARE

- A. See door schedule in drawings for hardware set assignments.
- B. Manufacturers and their abbreviations used in this schedule:
 - 1. CR Corbin/Russwin
 - 2. GJ Glynn Johnson (Match Existing)
 - 3. HA Hager
 - 4. NO Norton Closers
 - 5. PE Pemko
 - 6. RX Rixon
 - 7. VO Von Duprin
 - 8. TR Trimco MFG
- C. Hardware groups

HW SET: 01

6	EA	HINGE	BB1199 NRP	26D	HA
1	SET	AUTO FLUSH BOLT	845/945 w/ DUST PROOF STRIKE	630	GJ
1	EA	ENTRY W/	ML2065	626	CR
		DEADBOLT			
1	EA	CORDINATOR SET	500 SERIES	630	GJ
2	EA	CLOSER	P4040EDA SERIES PARALLEL ARM	689	NO
2	EA	OVERHEAD STOP	100H	630	GJ
2	EA	KICK PLATE	KAO050-2 .050 THICK 36" X 36" LDW	630	TR
1	EA	THRESHOLD	2750A MSES5	AL	PE
1	EA	ASTRAGAL SET	305CN	AL	PE
2	EA	GASKET	289IAS	AL	PE
1	EA	DOOR TOP	346C	AL	PE
		PROTECTION			
2	EA	DOOR BOTTOM DRI	P 345AV	AL	PE
		w/ SWEEP			

HW SET: 2 (EXISTING REINSTALL)

REINSTALL EXISTING HARDWARE ON NEW DOOR WITH HARDWARE AS SPECIFIED. MODFIY EXISTING FRAME FOR, STRIKE AND BOTTOM HINGE HEIGHT.

1	EA	CLOSER	P4040EDA SERIES PARALLEL ARM	689	NO
1	EA	OVERHEAD STOP	100H	630	GJ
1	EA	KICK PLATE	KA050 .050 THICK 36" X 36" LDW	630	TR
1	EA	GASKET	289IAS	AL	PE
1	EA	DOOR TOP	346C	AL	PE
		PROTECTION			
1	EA	A DOOR BOTTOM DRIP 345AV		AL	PE
		w/ SWEEP			

END OF SECTION 087100

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Concrete.
 - 2. Steel.
 - 3. Galvanized metal.

1.2 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.
- C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 25 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- D. Colors: Match existing conditions.
 - 1. 10 percent of surface area will be painted with deep tones.

2.3 PRIMERS/SEALERS

A. Primer, Bonding, Water Based: MPI #17.

2.4 METAL PRIMERS

- A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
- B. Primer, Galvanized, Water Based: MPI #134.
- C. Primer, Quick Dry, for Aluminum: MPI #95.

2.5 WOOD PRIMERS

A. Primer, Alkyd for Exterior Wood: MPI #5.

2.6 WATER-BASED PAINTS

A. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5): MPI #163.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 - 1. Latex System:
 - a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.
- B. Steel Substrates:
 - 1. Alkyd System:
 - a. Prime Coat: Primer, alkyd, anticorrosive for metal, MPI #79.
 - b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
 - c. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.
- C. Galvanized-Metal Substrates:
 - 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, galvanized, water based, MPI #134.
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
- D. Aluminum Substrates:
 - 1. Water-Based Light Industrial Coating System:

- a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
- b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
- c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
- E. Wood Substrates: Including wood trim.
 - 1. Latex over Alkyd Primer System:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.

END OF SECTION 099113

SECTION 220510 - GENERAL MECHANICAL PLUMBING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The mechanical Work is governed by the entire specification and not just Division 22, 23. The entire specification must be examined for requirements relating to the Work hereunder. The Work covered by this and all other Mechanical subsections consists of furnishing labor, equipment, and materials in accordance with the specifications or drawings, or both, together with any incidental items not shown or specified which can be reasonably inferred or taken as belonging to the Work and necessary in good practice to provide a complete system described or shown as intended.
- B. Project is a renovation that requires specific demolition and installation for project areas with the rest of the mechanical systems remaining active serving an occupied building.
 - 1. Shut downs of mechanical systems will generally occur in off hours and during light occupancy times. Coordinate shut down times to be a minimum time required.
 - 2. Construction documents for the renovation project do not show all required piping and offsets. Construction documents show reported as-built piping systems. Verify on site all existing conditions.
 - 3. Demolition of and Connection to Existing Material, Equipment, and Systems:
 - a. Mechanical drawings show reported as-built and contract document locations of underground piping taken from past project drawings. Contractor to determine actual existing locations of underground piping as needed without additional cost to the Owner. Contractor to utilize pipe location devices as needed. Contact ARCHITECT if actual piping locations are different than shown.
 - b. Coordinate demolition and connection to existing systems with phasing of Work.

C. SCOPE OF WORK

- 1. The Project is defined by the Contract Documents and consists of renovation of the indicated areas, systems, and components at the existing Bartlett Regional Hospital to allow the Roof Replacement of the 1968 and 1987 Buildings. The WORK shall be constructed under a single prime Contract. See Division 01 for information about scheduling work. The WORK will include:
 - A. Raising of the existing mechanical chilled water, horizontal vent piping, and related supports to maintain a clear height to the roof membrane. In general it is intended to reuse the existing pipe supports. Contractor to remove and relocate supports as required for new raised pipe locations. Modify and raise supports as required.
 - B. Modify chilled water piping as shown to accommodate the roof work.
 - C. Reinstall heat trace, insulation and provide metal covering of all modified chilled water piping and trim. Provide new insulation and covering on new piping. Coordinate reinstallation of heat trace on piping prior to pipe insulation.
 - D. Extend vent through roof piping as detailed.

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- E. Install interior roof drain piping and overflow piping from new roof drain assembly and connect to existing systems as shown. Insulate and label piping.
- F. Extend sheet metal collars through curbs on roof caps and fans to accommodate new higher elevation of curbs. Coordinate the relocation of caps and fans to new higher curbs.
- G. Drain and recharge chilled water system with water as required for Work. Coordinate with Owner on all utility shutdowns and start-ups.
- H. Work may be completed in two phases; see Division 01 for more information.

D. WORDING OF THE SPECIFICATIONS

1. These specifications are of the abbreviated or streamlined type and frequently include incomplete sentences. However, periods are used for clarity. Words such as "shall", "shall be", "the Contractor shall", and similar mandatory phrases shall be supplied by inference in the same manner as they are required for the notes on the drawings.

E. CODES AND REGULATIONS

- 1. All Work hereunder shall be strictly in conformance with applicable codes and regulations. All plumbing Work shall be in accordance with the Codes listed below and City and Borough of Juneau modifications insofar as minimum requirements are concerned, but the drawings and specifications shall govern in case the minimum requirements are exceeded. All electrical equipment shall bear the UL label.
 - a. Title 19: City and Borough of Juneau, Building Regulation
 - b. International Building Code and Mechanical Code-2006 edition
 - c. Uniform Plumbing Code-2006 edition
 - d. International Fire Code-2006 edition
 - e. City and Borough of Juneau Department of Health
 - f. State Department of Health
 - g. Local Fire Marshall
 - h. Occupational Safety and Health Administration (OSHA)
 - i. National Fire Protection Association (NFPA)
 - j. National Electric Code (NEC)
 - k. Alaska State Fire Laws
 - 1. Environmental Protection Agency (EPA)
 - m. Sheet Metal and Air Conditioning Contractors Association (SMACNA)

1.2 SUBMITTALS

A. General: Provide submittals according to Conditions of Contract, Division 1 Specifications Sections, and as required hereunder. Drawings and general provisions of the Contract, including General, Supplementary Conditions, and all Division 1 Specification Sections, apply to this Section. Approval of the data shall not eliminate responsibility for compliance with the Drawings or Specifications unless specific attention has been called in writing to proposed deviations at the time of transmittal of the data and such deviations have been approved, nor

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shall it eliminate the responsibility for freedom of errors of any sort in the data. All Mechanical submittal data for Project construction is to be turned in for approval at the same time in order for an efficient review process. Partial submittals may be rejected until the full submittal is received.

- B. Specified Products: Trade names and catalog numbers of manufactured products included herein are intended to indicate the type, size, and grade of quality of equipment and materials required and such equipment and materials are approved for installation, subject to full compliance with the Specifications. Except where single manufacture is specified for standardization, requests for approval of other manufacturers than those specified must be accompanied by complete descriptions including overall dimensions, performance data, and, if catalog material, identification of specific products or items proposed.
- C. Submittal Format: All data shall be submitted at one time in neatly bound loose-leaf three ring binders with pockets and tabulated in order of Specification Division 15000 section. All data shall be typed, minimum 10 point font, no exceptions. Data submitted that is not conforming to these specification requirements will be returned without reviewing and will need to be resubmitted at Contractors sole complete cost.
 - 1. Each binder shall have a set of separators with index tabs A to Z. Tabs are to be printed type. Slip-in tabs not acceptable.
 - 2. The first page shall be a cover sheet with project name, address, date, submittal product name, all applicable contractors and contact information, and all applicable consultants and contact information.
 - 3. Second page shall be a submittal manual index of all project Specification sections with respective tab numbers, and respective book number, if applicable.
 - 4. The first page of each manuals section shall be an index of that respective project Specification section and number with each product name, manufacturer name and model number.
 - 5. Each manuals section shall be labeled and certified by mechanical Subcontractor that the data presented is in accordance with project Specifications. Index sheet in front of completed binder listing each piece of equipment or material submitted.
 - 6. Product Data to be utilized shall be flagged and noted and all other data shall be crossed out or otherwise flagged that it is not in the project.
 - 7. Data shall be inserted in binders in order of Specification number. Specification number shall be clearly labeled on each submittal page.
 - 8. As-built Drawings: As-built drawings shall be required from all Mechanical Subcontractors and shall accurately show all changes from Contract Documents for existing and new piping, ductwork, and equipment. As-built drawings shall be updated daily and available for inspection on-site by the ARCHITECT.
 - 9. Operating and Maintenance Data: See Division 1 for the number of sets of data to be provided for submittal and additional requirements. Separate and complete manuals are required for the two volumes of mechanical work. Provide a minimum of four (4) copies. The following data shall be provided to the ARCHITECT for approval 30 days prior to the request for Substantial Completion inspection. Except for the valve directory and nameplate directory, the data shall be provided complete at one time. Partial or separate data will be returned for completion. See requirements under 1.4.C for additional submittal and formatting requirements.

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SECTION 220510 - GENERAL MECHANICAL PLUMBING

- 10. Submit prior to Substantial Completion Inspection and Final Inspection a detailed list of equipment and systems that will NOT be completed for the completion date. Include status and information of deficiencies from all previous inspection reports.
- 11. Submit prior to Re-inspections of Substantial Completion Inspections, if applicable, and the Final Inspection a marked copy of the previous Engineers Inspection Reports detailing all items that have been completed and all items that have not been completed with reasons thereof. Re-inspection or Final Inspection will not occur until receipt of this list.

D. COOPERATIVE WORK

- 1. The Work hereunder shall be coordinated between various mechanical sections with the Work specified under other divisions of contracts toward rapid completion of the entire project. If any cooperative Work must be altered due to lack of proper supervision hereunder, or failure to make proper provisions in time, then the Work hereunder shall include all expense of such changes as are necessary to be made in the Work under other divisions and contracts, and such changes shall be directly supervised by the ARCHITECT and shall be made to the satisfaction of the ARCHITECT.
- 2. In general pitched piping and ductwork shall take preference in location within the project area. Coordination of all drain valves and other equipment requiring access and maintenance procedures is required with all building components during construction for maximum accessibility and proper location as intended.
- 3. Existing systems: Where modifications are to be made to existing systems which are required to remain in service for areas of the building not affected by this Project, CONTRACTOR shall coordinate disruption with Using Agency. WORK shall be performed only upon specific Approval, time, and duration as agreed to by the ARCHITECT.

E. QUALITY ASSURANCE

- 1. Perform Work in conformance with all applicable codes, regulations, local ordinances, contract documents, and generally accepted good practice. If discrepancies exist between specifications and contract plans then the solution that provides the Owner with the highest quality of product or installation shall be deemed as intended by the contract documents.
- 2. All sheet metal workers shall be have a minimum documented sheet metal fabrication and installation experience in commercial and industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Sheet Metal Apprentice program. The ration of onsite workers shall not exceed 3 apprentices or sheet metal workers for every one foreman. A foreman is defined as a sheet metal worker with minimum 3 years experience as detailed above or is an approved Journeyman.
- 3. All Plumbers and Pipe Fitters shall have a minimum documented installation experience in commercial or industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Plumbers and Pipe Fitters Apprentice program. The ratio of on-site workers shall not exceed 2 apprentices or pipe fitters for every one Journeyman.

F. FIELD MEASUREMENTS

- 1. See Division 1 for specific requirements regarding: Field Measurements and Site Conditions.
- 2. Verifications: All measurements shall be verified at the site and prior to fabrications of

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SECTION 220510 - GENERAL MECHANICAL PLUMBING

equipment and systems. The existing conditions shall be fully observed before beginning the Work hereunder, and the Work hereunder executed in full coordination with the existing conditions observed. All hazardous material including asbestos materials that are discovered during the course of construction shall be immediately brought to the attention of the ARCHITECT for action. All Work performed with hazardous materials not approved by the Owner shall be at the full responsibility of the contractor and not the Owner.

3. Changes: Variations apparently necessary due to existing conditions shall be made only on approval in writing by the ARCHITECT.

G. TRANSPORTATION TO SITE AND ON-SITE STORAGE

1. Protection: Materials and equipment which are intended to be installed and operated inside completed building envelope shall be protected. It is CONTRACTOR'S responsibility to deliver all material and equipment to ARCHITECT at completion of WORK in an "as new condition." "As new condition" shall mean free of corrosion, dirt, rust, stain, or physical damage resulting from or during transportation to site, temporary storage at site, and construction period. CONTRACTOR must address potential damage to material and equipment caused by exposure to elements including wind, rain, and construction process. CONTRACTOR shall take all precautions to protect material and equipment. Precautions shall include, but not be limited to, protection from moisture to ensure materials and equipment remain dry, and equipment is reasonably free of debris. Material and equipment which have been exposed to moisture are subject to timely replacement by CONTRACTOR at no additional cost to OWNER.

H. WARRANTY

- 1. See Division 1 for specific requirements regarding: Product warranties and product bonds.
- 2. The contractor shall provide continuous and generally trouble-free operation of the mechanical systems for the time period listed in Division 1 or for one year after final completion of entire project whichever time period is longer. The operation and maintenance of systems other than incidental operations shall be the sole responsibility of the contractor and shall be addressed by the contractor immediately if deficiencies are present. Leaking of valves, flanges, or air vents shall be addressed immediately by the contractor during the warranty period. Control settings, noise problems, and other deficiencies resulting in unsatisfactory environmental conditions shall be addressed immediately.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 220510

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SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pipe Markers.

1.2 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; The American Society of Mechanical Engineers; 2007.

1.3 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 - PRODUCTS

2.1 PIPE MARKERS

- A. Manufacturers:
 - 1. Brady Corporation: www.bradycorp.com.
 - 2. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.
 - 3. MIFAB, Inc.: www.mifab.com.
 - 4. Seton Identification Products; www.seton.com.
 - 5. Substitutions: See Section 016000 Product Requirements.
- B. Comply with ASME A13.1.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

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3.2 INSTALLATION

. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions. Install on interior rain leader and overflow rain leader piping.

- 1. Identify service, flow direction, and pressure.
- 2. Install in clear view and align with axis of piping.
- 3. Locate identification not to exceed 20 feet on straight runs including risers and drops, at each side of penetration of structure or enclosure, and at each obstruction.

END OF SECTION 220553

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Piping insulation.
- B. Section includes thermal insulation for piping systems including vapor retarders, jackets, and accessories. All new piping is to be insulated as specified.

1.2 RELATED REQUIREMENTS

- A. Drawings and General provisions of the Contract, including General, Supplementary Conditions, and all Division Specifications Section, apply to this section.
- B. Section 221005 Plumbing Piping: Placement of hangers and hanger inserts.
- C. Section 232113 Hydronic Piping: Placement of hangers and hanger inserts.

1.3 REFERENCE STANDARDS

- A. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2007.
- B. ASTM C 177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus; 2004.
- C. ASTM C 449 Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007.
- D. ASTM C 518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2004.
- E. ASTM C 547 Standard Specification for Mineral Fiber Pipe Insulation; 2007.
- F. ASTM C 585 Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System); 1990 (Reapproved 2004).
- G. ASTM C 795 Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008.
- H. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
- I. ASTM E 96/E 96M Standard Test Methods for Water Vapor Transmission of Materials; 2005.

- J. NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.
- K. UL 723 Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; 2008.

1.4 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum 3 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.7 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E 84, NFPA 255, or UL 723.

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2.2 GLASS FIBER

- A. Manufacturers:
 - 1. Knauf Insulation: www.knaufusa.com.
 - 2. Johns Manville Corporation: www.jm.com.
 - 3. Owens Corning Corp: www.owenscorning.com.
 - 4. CertainTeed Corporation; www.certainteed.com.
 - 5. Substitutions: See Section 016000 Product Requirements.
- B. Insulation: ASTM C 547 and ASTM C 795; rigid molded, noncombustible.
 - 1. 'K' value: ASTM C 177, 0.24 at 75 degrees F.
 - 2. Maximum service temperature: 850 degrees F.
 - 3. Maximum moisture absorption: 0.2 percent by volume.
- C. Insulation: ASTM C 547 and ASTM C 795; semi-rigid, noncombustible, end grain adhered to jacket.
 - 1. 'K' value: ASTM C 177, 0.24 at 75 degrees F.
 - 2. Maximum service temperature: 650 degrees F.
 - 3. Maximum moisture absorption: 0.2 percent by volume.
- D. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E 96/E 96M of 0.02 perminches.
- E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

2.3 JACKETS

- A. PVC Plastic.
 - 1. Manufacturers:
 - a. Johns Manville Corporation; www.jm.com.
 - b. Substitutions: See Section 016000 Product Requirements.
 - 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E 96/E 96M.
 - d. Thickness: 10 mil.
 - e. Connections: Brush on welding adhesive.

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, flanges.
- E. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert location: Between support shield and piping and under the finish jacket.
 - 4. Insert configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
- F. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.

3.3 SCHEDULES

- A. Plumbing Systems:
 - 1. Roof Drain Bodies, Glass Fiber Insulation, Thickness: 1-1/2 inch.
 - 2. Roof Drainage, Glass Fiber Insulation., Thickness: 1-1/2 inch.

END OF SECTION 220719

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SECTION 221005 - PLUMBING PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pipe, pipe fittings, and connections for piping systems.
 - 1. Storm/rain water.
 - 2. Vent piping.

1.2 RELATED REQUIREMENTS

- A. Section 078413 Penetration Firestopping.
- B. Section 220553 Identification for Plumbing Piping and Equipment.
- C. Section 220719 Plumbing Piping Insulation.

1.3 REFERENCE STANDARDS

- A. CISPI 301 Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2005.
- B. CISPI 310 Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2004.
- C. MSS SP-58 Pipe Hangers and Supports Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.
- D. MSS SP-69 Pipe Hangers and Supports Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- E. MSS SP-89 Pipe Hangers and Supports Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

1.4 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide manufacturers catalog information.
- C. Project Record Documents.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Alaska, standards.
 - 1. Maintain one copy on project site.
- B. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.6 REGULATORY REQUIREMENTS

A. Perform Work in accordance with State of Alaska plumbing code.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Particular care shall be taken in storage and handling of such materials to maintain its clean condition. Provide temporary end caps and closures on piping and fittings until ready for immediate use. Maintain in place until installation. Store piping and equipment in clean, enclosed from weather, location at all times. Materials are not to be stored in direct contact with dirty surfaces or on dirt floor. If piping, equipment, and components are found to be improperly stored they shall be removed from the project immediately and new, clean materials shall be used.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 - PRODUCTS

2.1 STORM WATER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310, neoprene gaskets and stainless steel heavy duty clamp-and-shield assemblies. Heavy Duty Coupling Assembly; Clamp-All or Anoco Husky Series 4000 couplings.

2.2 VENT PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 - 1. Fittings: Cast iron.

SECTION 221005 - PLUMBING PIPING

2. Joints: CISPI 310, neoprene gaskets and stainless steel heavy duty clamp-and-shield assemblies. Heavy Duty Coupling Assembly; Clamp-All or Anoco Husky Series 4000 couplings.

2.3 PIPE HANGERS AND SUPPORTS

- A. Plumbing Piping Storm Water and Vent:
 - 1. Conform to ASME B31.9.
 - 2. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 7. Vertical Support: Steel riser clamp.
 - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

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. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- C. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 220719.

SECTION 221005 - PLUMBING PIPING

- G. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- H. Install water piping to ASME B31.9.
- I. Sleeve pipes passing through partitions, walls and floors.
- J. Inserts:
 - 1. Drill through concrete slab from below and provide expansion type anchor bolt.
- K. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as scheduled.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 7. Support cast iron drainage piping at every joint.

3.3 TOLERANCES

A. Storm Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

3.5 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe size: 2-1/2 inches to 3 inches:
 - 1) Maximum hanger spacing: 10 ft.
 - 2) Hanger rod diameter: 1/2 inch.

END OF SECTION 221005

SECTION 221006 - PLUMBING PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Roof drains.
- B. Overflow roof drains.
- C. Cleanouts.

1.2 RELATED REQUIREMENTS

- A. Drawings and General provisions of the Contract, including General, Supplementary Conditions, and all Division Specifications Section, apply to this section.
- B. Section 221005 Plumbing Piping.
- C. Section 224000 Plumbing Fixtures.

1.3 REFERENCE STANDARDS

- A. ASME A112.6.3 Floor and Trench Drains; The American Society of Mechanical Engineers; 2001 (R2007).
- B. ASSE 1012 Backflow Preventer with Intermediate Atmospheric Vent; American Society of Sanitary Engineering; 2002 (ANSI/ASSE 1012).
- C. ASSE 1013 Reduced Pressure Principle Backflow Preventers and Reduced Pressure Fire Protection Principle Backflow Preventers; American Society of Sanitary Engineering; 2005.
- D. ASSE 1019 Vacuum Breaker Wall Hydrants, Freeze Resistant Automatic Draining Type; American Society of Sanitary Engineering; 2004, and Errata 2005 (ANSI/ASSE 1019).
- E. PDI-WH 201 Water Hammer Arresters; Plumbing and Drainage Institute; 2006.

1.4 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

SECTION 221006 - PLUMBING PIPING SPECIALTIES

- D. Project Record Documents: Record actual locations of equipment, cleanouts, water hammer arrestors.
- E. Operation Data: Indicate frequency of treatment required for interceptors.
- F. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- G. Maintenance Materials: Furnish the following for City and Borough of Juneau's use in maintenance of project.
 - 1. See Section 016000 Product Requirements, for additional provisions.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 - PRODUCTS

2.1 DRAINS

- A. Manufacturers:
 - 1. Josam Company: www.josam.com.
 - 2. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
 - 3. Zurn Industries, Inc: www.zurn.com.
 - 4. Substitutions: See Section 016000 Product Requirements.
- B. Roof Drains (RD-1):
 - 1. Assembly: ASME A112.6.4.
 - 2. Body: Lacquered cast iron with sump.
 - 3. Strainer: Removable polyethylene dome with vandal proof screws.
 - 4. Accessories: Coordinate with roofing type.
 - a. Membrane flange and membrane clamp with integral gravel stop.
 - b. Adjustable under deck clamp.
 - c. Roof sump receiver.
 - d. Controlled flow weir.
 - e. Leveling frame.
 - f. Adjustable extension sleeve for roof insulation.

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SECTION 221006 - PLUMBING PIPING SPECIALTIES

- C. Roof Overflow Drains (ORD-1):
 - 1. Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended to 2 inches above flood elevation.
- D. Downspout Nozzles (RLN-1)
 - 1. Bronze round with straight bottom section.

2.2 CLEANOUTS

- A. Manufacturers:
 - 1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
 - 2. Josam Company: www.josam.com.
 - 3. Zurn Industries, Inc: www.zurn.com.
 - 4. Substitutions: See Section 016000 Product Requirements.
- B. Cleanouts at Interior Finished Floor Areas:
 - 1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
- C. Cleanouts at Interior Finished Wall Areas:
 - 1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.
- D. Cleanouts at Interior Unfinished Accessible Areas: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.

END OF SECTION 221006

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PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The mechanical Work is governed by the entire specification and not just Division 22, 23. The entire specification must be examined for requirements relating to the Work hereunder. The Work covered by this and all other Mechanical subsections consists of furnishing labor, equipment, and materials in accordance with the specifications or drawings, or both, together with any incidental items not shown or specified which can be reasonably inferred or taken as belonging to the Work and necessary in good practice to provide a complete system described or shown as intended.
- B. Project is a renovation that requires specific demolition and installation for project areas with the rest of the mechanical systems remaining active serving an occupied building.
 - 1. Shut downs of mechanical systems will generally occur in off hours and during light occupancy times. Coordinate shut down times to be a minimum time required.
 - 2. Construction documents for the renovation project do not show all required piping and offsets for a complete and operating systems. Existing systems may require new systems to be modified for installation. Construction documents show reported as-built piping systems. Verify on site all existing conditions.
 - 3. Demolition of and Connection to Existing Material, Equipment, and Systems:
 - a. Mechanical drawings show reported as-built and contract document locations of underground piping taken from past project drawings. Contractor to determine actual existing locations of underground piping as needed without additional cost to the Owner. Contractor to utilize pipe location devices as needed. Contact ARCHITECT if actual piping locations are different than shown.
 - 1) Where select piping systems are shown to be partially removed for connection, prepare and protect the connection points appropriately to ensure later continuity of Work. CONTRACTOR shall provide all temporary supports as required and completely replace material and equipment that are not suitably protected during construction and becomes damaged.
 - 2) CONTRACTOR shall provide all temporary caps for ductwork, piping, pneumatic controls, as required. CONTRACTOR shall provide all temporary partitions such as air-tight air plenum separations as required to maintain continuity of systems and to not contaminate existing systems or finishes. CONTRACTOR shall remove all temporary provisions when the phase of Work is completed or earlier if required.
 - 3) Where items are shown to be removed such as piping or ductwork it is to be assumed that this includes the removal of the respective system including but not limited to pipe and duct hangers, supports, conduit, wiring, valves, and other related trim and appurtenances. Piping to be removed through a floor assumes that the piping is to be capped below floor and the floor finished smooth.
 - 4) Mechanical Contractor shall be available during Demolition Work for coordination and assistance for related Work. Mechanical Contractor shall locate, isolate, and drain piping systems to be removed.

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- 5) Concrete wall and floor penetrations required. Saw cut or core drill as required. Sleeve penetrations as specified. Coordinate with Architect for structural beam penetration approvals.
- 6) Demolition drawings do not show all work involved but rather a representation of the work expected. Demolition drawings are to be coordinated with the phase drawings for more information as to when work may be required.

C. SCOPE OF WORK

- 1. The Project is defined by the Contract Documents and consists of renovation of the indicated areas, systems, and components at the existing Bartlett Regional Hospital to allow the Roof Replacement of the 1968 and 1987 Buildings. The WORK shall be constructed under a single prime Contract. See Division 01 for information about scheduling work. The WORK will include:
 - A. Raising of the existing mechanical chilled water, horizontal vent piping, and related supports to maintain a clear height to the roof membrane. In general it is intended to reuse the existing pipe supports. Contractor to remove and relocate supports as required for new raised pipe locations. Modify and raise supports as required.
 - B. Modify chilled water piping as shown to accommodate the roof work.
 - C. Reinstall heat trace, insulation and provide metal covering of all modified chilled water piping and trim. Provide new insulation and covering on new piping. Coordinate reinstallation of heat trace on piping prior to pipe insulation.
 - D. Extend vent through roof piping as detailed.
 - E. Install interior roof drain piping and overflow piping from new roof drain assembly and connect to existing systems as shown. Insulate and label piping.
 - F. Extend sheet metal collars through curbs on roof caps and fans to accommodate new higher elevation of curbs. Coordinate the relocation of caps and fans to new higher curbs.
 - G. Drain and recharge chilled water system with water as required for Work. Coordinate with Owner on all utility shutdowns and start-ups.
 - H. Work may be completed in two phases; see Division 01 for more information

D. WORDING OF THE SPECIFICATIONS

1. These specifications are of the abbreviated or streamlined type and frequently include incomplete sentences. However, periods are used for clarity. Words such as "shall", "shall be", "the Contractor shall", and similar mandatory phrases shall be supplied by inference in the same manner as they are required for the notes on the drawings.

E. CODES AND REGULATIONS

- 1. All Work hereunder shall be strictly in conformance with applicable codes and regulations. All plumbing Work shall be in accordance with the Codes listed below and City and Borough of Juneau modifications insofar as minimum requirements are concerned, but the drawings and specifications shall govern in case the minimum requirements are exceeded. All electrical equipment shall bear the UL label.
 - a. Title 19: City and Borough of Juneau, Building Regulation
 - b. International Building Code and Mechanical Code-2006 edition
 - c. Uniform Plumbing Code-2006 edition
 - d. International Fire Code-2006 edition
 - c. Uniform Fire Code (UFC)
 - d. Local Sewer and Water District Requirements
 - e. City and Borough of Juneau Department of Health
 - f. State Department of Health
 - g. Local Fire Marshall
 - h. Local Air Pollution Control Agency
 - i. State of Alaska Boiler and Unfired Pressure Vessel Inspection Law
 - j. Occupational Safety and Health Administration (OSHA)
 - k. National Fire Protection Association (NFPA)
 - 1. National Electric Code (NEC)
 - m. Alaska State Fire Laws
 - n. Environmental Protection Agency (EPA)
 - o. Sheet Metal and Air Conditioning Contractors Association (SMACNA)
 - p. Pressure Vessels: ASME code stamp required on all pressure vessels and relief valves.

1.2 SUBMITTALS

- A. General: Provide submittals according to Conditions of Contract, Division 1 Specifications Sections, and as required hereunder. Drawings and general provisions of the Contract, including General, Supplementary Conditions, and all Division 1 Specification Sections, apply to this Section. Approval of the data shall not eliminate responsibility for compliance with the Drawings or Specifications unless specific attention has been called in writing to proposed deviations at the time of transmittal of the data and such deviations have been approved, nor shall it eliminate the responsibility for freedom of errors of any sort in the data. All Mechanical submittal data for Project construction is to be turned in for approval at the same time in order for an efficient review process. Partial submittals may be rejected until the full submittal is received.
- B. Specified Products: Trade names and catalog numbers of manufactured products included herein are intended to indicate the type, size, and grade of quality of equipment and materials required and such equipment and materials are approved for installation, subject to full compliance with the Specifications. Except where single manufacture is specified for standardization, requests for approval of other manufacturers than those specified must be accompanied by complete descriptions including overall dimensions, performance data, and, if catalog material, identification of specific products or items proposed.

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- C. Submittal Format: All data shall be submitted at one time in neatly bound loose-leaf three ring binders with pockets and tabulated in order of Specification Division 15000 section. All data shall be typed, minimum 10 point font, no exceptions. Data submitted that is not conforming to these specification requirements will be returned without reviewing and will need to be resubmitted at Contractors sole complete cost.
 - 1. Each binder shall have a set of separators with index tabs A to Z. Tabs are to be printed type. Slip-in tabs not acceptable.
 - 2. The first page shall be a cover sheet with project name, address, date, submittal product name, all applicable contractors and contact information, and all applicable consultants and contact information.
 - 3. Second page shall be a submittal manual index of all project Specification sections with respective tab numbers, and respective book number, if applicable.
 - 4. The first page of each manuals section shall be an index of that respective project Specification section and number with each product name, manufacturer name and model number.
 - 5. Each manuals section shall be labeled and certified by mechanical Subcontractor that the data presented is in accordance with project Specifications. Index sheet in front of completed binder listing each piece of equipment or material submitted.
 - 6. Product Data to be utilized shall be flagged and noted and all other data shall be crossed out or otherwise flagged that it is not in the project.
 - 7. Data shall be inserted in binders in order of Specification number. Specification number shall be clearly labeled on each submittal page.
 - 8. As-built Drawings: As-built drawings shall be required from all Mechanical Subcontractors and shall accurately show all changes from Contract Documents for existing and new piping, ductwork, and equipment. As-built drawings shall be updated daily and available for inspection on-site by the ARCHITECT.
 - 9. Operating and Maintenance Data: See Division 1 for the number of sets of data to be provided for submittal and additional requirements. Separate and complete manuals are required for the two volumes of mechanical work. Provide a minimum of four (4) copies. The following data shall be provided to the ARCHITECT for approval 30 days prior to the request for Substantial Completion inspection. Except for the valve directory and nameplate directory, the data shall be provided complete at one time. Partial or separate data will be returned for completion. The valve directory and nameplate directory may be provided for approval previous to the other data. The first section of the O&M manual shall be as listed in the following subparagraphs in order presented hereunder. All of the following subparagraphs sections shall be furnished with permanent plastic see through covers. See requirements under 1.4.C for additional submittal and formatting requirements.
 - a. Cover and Index sheets as in 1.4.C. above.
 - b. Description of systems and operating instructions: The Contractor shall prepare a brief type written description of all new and modified systems, explaining how the systems operate and indicating the proper settings of controls and switches. The instructions are to include all information required for the proper settings of controls and switches. The instructions are to include all information required for the proper settings of the proper operation of the systems. Technical knowledge on controls or adjustments requiring specialized technicians should not be included in the instructions.
 - c. Manufacturers' literature: Manufacturers' instructions for operation and maintenance of all mechanical equipment and specialties, including replacement parts lists,

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capacity curves or charts, equipment data sheets, manufacturers' literature on the equipment, and as-built wiring diagrams and control drawings, all suitable for side binding to $8-1/2 \ge 11$ inch size. All data not applicable to the job is to be crossed out or deleted. Manuals turned in for review with non-applicable data not crossed out shall be returned to the Contractor.

- d. Maintenance instructions: Typewritten instructions for the maintenance of the systems, listing each service required on all of the mechanical equipment, including inspections, lubrication, cleaning, checking, and all other operations required. The list is to include all types of bearings installed on the equipment and the type of lubricant required.
- e. Maintenance schedule: List of each item of mechanical equipment requiring inspection, lubrication, cleaning, or service including the type of bearings and type of lubricating means for each piece of equipment. Each item of equipment is to be listed separately with the service required. List to include the times during the year when such inspection and maintenance shall be performed. The specific maintenance required shall be referenced back to the maintenance instructions.
- f. Valve directory: Indicating valve number, size, location, function, and normal position for each numbered valve. The directory shall be provided and approved before installation of the valve tags. A sample arrangement will be furnished upon request. Two copies required for the preliminary list. See Section 15075 Mechanical Identification.
- 10. Guide Documents: Sample operating and maintenance instructions and maintenance schedule may be obtained from the ARCHITECT upon request, to assist in properly setting up the data.
- 11. Instructions To Personnel: The mechanical Subcontractor shall instruct operating personnel in the operation and maintenance of the systems before accepting the responsibility of operation and maintenance of the systems.
- 12. Qualification Data: For sheet metal installers. For pipe fitters.
- 13. Shop Drawings: Verify on-site as-built conditions during demolition of construction if required where system is concealed. Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections. Shop drawings shall be coordinated and corrected with all other disciplines for interference and location of existing and new conditions prior to submittal to ARCHITECT.
- 14. Submit prior to Substantial Completion Inspection and Final Inspection a detailed list of equipment and systems that will NOT be completed for the completion date. Include status and information of deficiencies from all previous inspection reports.
- 15. Submit prior to Re-inspections of Substantial Completion Inspections, if applicable, and the Final Inspection a marked copy of the previous Engineers Inspection Reports detailing all items that have been completed and all items that have not been completed with reasons thereof. Re-inspection or Final Inspection will not occur until receipt of this list.

D. COOPERATIVE WORK

1. The Work hereunder shall be coordinated between various mechanical sections including Division 13 and with the Work specified under other divisions of contracts toward rapid completion of the entire project. If any cooperative Work must be altered due to lack of proper supervision hereunder, or failure to make proper provisions in time, then the Work

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hereunder shall include all expense of such changes as are necessary to be made in the Work under other divisions and contracts, and such changes shall be directly supervised by the ARCHITECT and shall be made to the satisfaction of the ARCHITECT.

- 2. In general pitched piping and ductwork shall take preference in location within the project area. Coordination of all drain valves, duct access doors, and other equipment requiring access and maintenance procedures is required with all building components during construction for maximum accessibility and proper location as intended.
- 3. Existing systems: Where modifications are to be made to existing systems which are required to remain in service for areas of the building not affected by this Project, CONTRACTOR shall coordinate disruption with Using Agency. WORK shall be performed only upon specific Approval, time, and duration as agreed to by the ARCHITECT.

E. QUALITY ASSURANCE

- 1. Perform Work in conformance with all applicable codes, regulations, local ordinances, contract documents, and generally accepted good practice. If discrepancies exist between specifications and contract plans then the solution that provides the Owner with the highest quality of product or installation shall be deemed as intended by the contract documents.
- 2. All sheet metal workers shall be have a minimum documented sheet metal fabrication and installation experience in commercial and industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Sheet Metal Apprentice program. The ration of onsite workers shall not exceed 3 apprentices or sheet metal workers for every one foreman. A foreman is defined as a sheet metal worker with minimum 3 years experience as detailed above or is an approved Journeyman.
- 3. All Plumbers and Pipe Fitters shall have a minimum documented installation experience in commercial or industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Plumbers and Pipe Fitters Apprentice program. The ratio of on-site workers shall not exceed 2 apprentices or pipe fitters for every one Journeyman.

F. FIELD MEASUREMENTS

- 1. See Division 1 for specific requirements regarding: Field Measurements and Site Conditions.
- 2. Verifications: All measurements shall be verified at the site and prior to fabrications of equipment and systems. The existing conditions shall be fully observed before beginning the Work hereunder, and the Work hereunder executed in full coordination with the existing conditions observed. All hazardous material including asbestos materials that are discovered during the course of construction shall be immediately brought to the attention of the ARCHITECT for action. All Work performed with hazardous materials not approved by the Owner shall be at the full responsibility of the contractor and not the Owner.
- 3. Changes: Variations apparently necessary due to existing conditions shall be made only on approval in writing by the ARCHITECT.

G. TRANSPORTATION TO SITE AND ON-SITE STORAGE

1. Protection: Materials and equipment which are intended to be installed and operated inside completed building envelope shall be protected. It is CONTRACTOR'S responsibility to

deliver all material and equipment to ARCHITECT at completion of WORK in an "as new condition." "As new condition" shall mean free of corrosion, dirt, rust, stain, or physical damage resulting from or during transportation to site, temporary storage at site, and construction period. CONTRACTOR must address potential damage to material and equipment caused by exposure to elements including wind, rain, and construction process. CONTRACTOR shall take all precautions to protect material and equipment. Precautions shall include, but not be limited to, protection from moisture to ensure materials and equipment remain dry, and equipment is reasonably free of debris. Material and equipment which have been exposed to moisture are subject to timely replacement by CONTRACTOR at no additional cost to OWNER.

H. WARRANTY

- 1. See Division 1 for specific requirements regarding: Product warranties and product bonds.
- 2. The contractor shall provide continuous and generally trouble-free operation of the mechanical systems for the time period listed in Division 1 or for one year after final completion of entire project whichever time period is longer. The operation and maintenance of systems other than incidental operations such as room thermostat settings or changing of air filters, shall be the sole responsibility of the contractor and shall be addressed by the contractor immediately if deficiencies are present. Leaking of valves, flanges, or air vents shall be addressed immediately by the contractor during the warranty period. Control settings, noise problems, and other deficiencies resulting in unsatisfactory environmental conditions shall be addressed immediately.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 220510

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping insulation.

1.2 RELATED REQUIREMENTS

- A. Drawings and General provisions of the Contract, including General, Supplementary Conditions, and all Division Specifications Section, apply to this section.
- B. Section 232113 Hydronic Piping: Placement of hangers and hanger inserts.

1.3 REFERENCE STANDARDS

- A. ASTM A 666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.
- B. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2007.
- C. ASTM C 177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus; 2004.
- D. ASTM C 195 Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007.
- E. ASTM C 534/C 534M Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2008.
- F. ASTM C 547 Standard Specification for Mineral Fiber Pipe Insulation; 2007.
- G. ASTM C 795 Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008.
- H. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
- I. ASTM E 96/E 96M Standard Test Methods for Water Vapor Transmission of Materials; 2005.
- J. NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.
- K. UL 723 Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; 2008.

1.4 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum 3 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.7 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E 84, NFPA 255, or UL 723.

2.2 GLASS FIBER

- A. Manufacturers:
 - 1. einsulation.com, Inc.: www.eninsulation.com
 - 2. Knauf Insulation: www.knaufusa.com.
 - 3. Johns Manville Corporation: www.jm.com.
 - 4. Owens Corning Corp: www.owenscorning.com.

HVAC PIPING INSULATION Page 230719 - 2

- 5. CertainTeed Corporation,www.certainteed.com.
- B. Insulation: ASTM C 547 and ASTM C 795; rigid molded, noncombustible.
 - 1. 'K' value: ASTM C 177, 0.24 at 75 degrees F.
 - 2. Maximum service temperature: 850 degrees F.
 - 3. Maximum moisture absorption: 0.2 percent by volume.
- C. Insulation: ASTM C 547 and ASTM C 795; semi-rigid, noncombustible, end grain adhered to jacket.
 - 1. 'K' value: ASTM C 177, 0.24 at 75 degrees F.
 - 2. Maximum service temperature: 650 degrees F.
 - 3. Maximum moisture absorption: 0.2 percent by volume.
- D. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E 96/E 96M of 0.02 perminches.

2.3 JACKETS

- A. PVC Plastic.
 - 1. Manufacturers:
 - a. Johns Manville Corporation: www.jm.com.
 - 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E 96/E 96M.
 - d. Thickness: 10 mil.
 - e. Connections: Brush on welding adhesive.
- B. Exterior Exposed, Chilled Water:
 - 1. Metal jacket, galvanized steel or aluminum, with rivets fastened on bottom.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, and flanges.
- D. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert location: Between support shield and piping and under the finish jacket.
 - 4. Insert configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - 5. Insert material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- E. Chilled water piping system is heat traced. Coordinate installation of insulation with Electrical for installation of heat trace.
- F. Install metal jacket around entire chilled water piping system with seams and rivets on bottom to allow drainage.

3.3 SCHEDULES

A. Cooling Systems, Chilled Water, Glass Fiber Insulation: Thickness: 1-1/2 inch.

END OF SECTION 230719

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pipe and pipe fittings for:
 - 1. Chilled water piping system.
 - 2. Equipment drains.

1.2 RELATED REQUIREMENTS

- A. Section 230719 HVAC Piping Insulation.
- B. Drawings and General provisions of the Contract, including General, Supplementary Conditions, and all Division Specifications Section, apply to this section.

1.3 REFERENCE STANDARDS

- A. ASME (BPV IX) Boiler and Pressure Vessel Code, Section IX Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2007.
- B. ASME B16.3 Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- C. ASME B31.9 Building Services Piping; The American Society of Mechanical Engineers; 2004 (ANSI/ASME B31.9).
- D. AWWA C606 Standard Specification for Grooved and Shouldered Joints; American Water Works Association; 2006.
- E. MSS SP-58 Pipe Hangers and Supports Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.
- F. MSS SP-69 Pipe Hangers and Supports Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- M. MSS SP-89 Pipe Hangers and Supports Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- N. ASTM A 53/A 53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2007.
- O. ASTM A 234/A 234M Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2007.

1.4 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Product Data: Include data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.
- D. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with minimum 3 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 - PRODUCTS

2.1 HYDRONIC SYSTEM REQUIREMENTS

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers and supports as required, as indicated, and as follows:
 - 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
 - 2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
 - 3. Provide pipe hangers and supports in accordance with ASME B31.9 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.

- D. Valves: Provide valves where indicated and as follows:
 - 1. Provide drain valves where indicated, and if not indicated provide at least at, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch gate valves with cap; pipe to nearest floor drain.

2.2 CHILLED WATER PIPING, ABOVE GRADE

- A. For Exterior Chilled Water Piping: Steel Pipe; ASTM A 53/A 53M, Schedule 40, black; using one of the following joint types:
 - 1. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.

2.3 PIPE HANGERS AND SUPPORTS

- A. Conform to ASME B31.9.
- B. Wall Support for Pipe Sizes 4 Inches and Over: Galvanized steel pipe clamp bracket.
- C. Vertical Support: Galvanzied steel riser clamp.
- D. Support for Cold Pipe: Galvanized steel adjustable extended pipe clamp, fasteners, lock nut, flange, and supports.
- E. Piping Roof Supports, unattached to roofing system: Medium load, rated load for 500 lbs. Suitable for use with 2 pipe clamps. Recycled rubber base, UV resistant. Similar to MIFAB C-Port, ERICO Caddy. Coordinate with Architectural for Roofing system.
- F. Piping Roof Supports, attached to roofing system: Reuse all existing attached roofing curbs. Curbs to be raised for new roof heights in General Work. Coordinate with Architectural for Roofing System. Modify existing pipe supports as required for new curb height.

2.4 UNIONS, FLANGES, AND COUPLINGS

- A. Unions for Pipe 2 Inches and Under:
 - 1. Ferrous Piping: 150 psig malleable iron, threaded.
- B. Flanges for Pipe Over 2 Inches:
 - 1. Ferrous Piping: 150 psig forged steel, slip-on. Galvanized.
 - 2. Gaskets: 1/16 inch thick preformed neoprene.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.

1. Dimensions and Testing: In accordance with AWWA C606. BRH ROOF REPLACEMENT CBJ Contract No. E11-286

HYDRONIC PIPING Page 232113 - 3

- 2. Housing Material: Malleable iron or ductile iron, galvanized.
- 3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
- 4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Prepare pipe for grooved mechanical joints as required by coupling manufacturer.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare piping connections to equipment using jointing system specified.
- E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- F. After completion, fill and clean systems.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install chilled water piping to ASME B31.9 requirements.
- C. Route piping in orderly manner, parallel to building structure, and maintain gradient.
- D. Install piping to conserve building space and to avoid interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Slope piping and arrange to drain at low points.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- I. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 3. Provide supports that encompass the outside the insulated piping.
 - 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

- J. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- L. Install valves with stems upright or horizontal, not inverted.
- M. Reuse all existing attached roofing curbs with modifications to curbs for new roof heights in General Work. Coordinate with Architectural Roofing System for heights of curbs and for new pipe supports connections. Modify existing pipe supports for new curb heights as required.
- N. Provide unattached curbs where shown with pipe supports as required. See Section 232113 2.3.E.
- O. Remove existing metal covered pipe insulation assembly and heat trace as required for modifications to piping. Reinstall pipe insulation assembly and heat race as required.
- P. Piping Tests: All heating piping tested hydrostatically at 125 psi for minimum of four hours. System shall remain tight for test period without leaks, displacement, or straining. Equipment, gauges, and thermometer wells rated for lesser pressure suitable protected during tests. Leaks developed during test shall be corrected without caulking and test restarted until a perfectly tight system is obtained. Enclosed piping tested before concealing. Test performed in presence of Owner.

END OF SECTION 232113