Project Manual for:

MULTISITE ROOFING 2014

Churchill High School
Sheldon High School
Kelly Middle School
Education Center

Eugene, Oregon

Eugene School District 4J
CIP No. 420.780.209

Set No:

17 April 2014

PROJECT TITLE PAGE

PROJECT TITLE: MULTISITE ROOFING 2014

CHURCHILL HIGH SCHOOL - 1850 Bailey Hill Road, Eugene, OR 97405

SHELDON HIGH SCHOOL - 2455 Willakenzie Road, Eugene, OR 97401

KELLY MIDDLE SCHOOL - 850 Howard Avenue, Eugene, OR 97404

EDUCATION CENTER - 200 North Monroe Street, Eugene, OR 97402

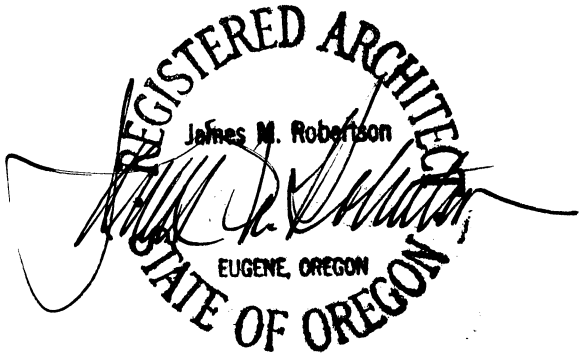
C.I.P. No. 430.780.209

OWNER: EUGENE SCHOOL DISTRICT 4J

715 West 4th Street, Eugene, Oregon 97402

Tel (541) 790-7417 Fax (541) 790-7420

Contact: Don Philpot, Project Manager



ARCHITECT: ROBERTSON/SHERWOOD/ARCHITECTS PC

132 East Broadway, #540, Eugene, OR 97401

Tel (541) 342-8077 Fax (541) 345-4302

Contact: Brian Hamilton, AIA

STRUCTURAL ENGINEER: METZLER ENGINEERING GROUP

220 East 11th Ave, Eugene, OR 97401

Tel (541) 344-2040 Fax (541) 344-1821

Contact: Scott Metzler, PE

MECHANICAL ENGINEER: MOULDS MECHANICAL ENGINEERING

2190 W. 11th Avenue, Eugene, OR 97402

Tel (541) 484-0241 Fax (541) 484-0191

Contact: Chris Moulds, PE

ELECTRICAL ENGINEER: JLG ENGINEERING, LLC

31910 Owl Road, Eugene, OR 97402

Tel (541) 912-0065

Contact: Jeff Graper, PE

DATE: 17 April 2014

END OF PROJECT TITLE PAGE

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CIP No. 430.780.209
March 26, 2014

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CIP No. 430.780.209
May 3, 2013

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A3	Churchill High School Roof Plan - Areas A-E
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A6	Churchill High School Roof Plan - Area L, Enlarged Plan
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A10	Education Center Roof Plans
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END OF LIST OF DRAWINGS

INVITATION TO BID

Sealed bids will be received by Kathi Hernandez, Facilities Management Assistant, for the Multisite Roofing 2014 project on Tuesday, May 13, 2014 until the Deadline for Bid Submission at 2:00 pm local time at the Eugene School District 4J Facilities Management Office, 715 West Fourth Avenue, Eugene, Oregon 97402. The Bids will be opened publicly and read aloud immediately after the deadline for submission of bids. Late Bids will not be considered.

Briefly, the work is described as reroofing and condensing unit replacement at Churchill High School, expansion joint replacement at Sheldon High School, reroofing at Kelly Middle School, reroofing at Education Center, and related demolition work at each of the four sites in Eugene, Oregon.

Beginning April 18, 2014, Prime Bidders, Sub-bidders, and Suppliers may obtain bidding documents at the following hyperlink: http://www.4j.lane.edu/bids/roofing-2014. Hard copies are not provided by the School District. It is the responsibility of all Prime Bidders, Sub-bidders, and Suppliers to obtain and all Addenda from the hyperlink.

Bidders and suppliers may also obtain bidding documents from Central Print and Reprographic Services, 45 West 5th Ave, Eugene, Oregon, by paying the cost of reproduction. It is the responsibility of those obtaining Bidding Documents in this manner to obtain any and all addenda from the hyperlink or the Plan Centers.

Bidding Documents may be examined at the following locations:

- Eugene Builder's Exchange, 2460 W. 11th, Eugene, OR 97402
- Central Oregon Builders Exchange, 1902 NE 4th Street, Bend, OR 97701
- McGraw Hill Construction, 3461 NW Yeon Ave. Portland, OR 97210
- Daily Journal of Commerce Plan Center, 921 SW Washington St., Ste 210, Portland, OR 97205-2810
- Douglas County Plan Center, 3076 NE Diamond Lake Blvd, Roseburg, OR 97470
- Oregon Contractor Plan Center, 5468 SE International Way, Milwaukie, OR 97222
- Reed Construction Data, 30 Technology Parkway South, Ste 500, Norcross, GA 90092
- Salem Contractor's Exchange, 2256 Judson Street SE, Salem, OR 97309
- Willamette Valley Bid Center, 32054 Old Hwy 34, Tangent, OR 97389
- Or, the offices of Robertson/Sherwood/Architects, 132 E. Broadway, Ste 540, Eugene, OR 97401

Any questions related to obtaining bid documents may be directed to Robertson/Sherwood/Architects, 541-342-8077.

A MANDATORY pre-bid conference and walk-through has been scheduled for Thursday, May 1, 2014, beginning at 10 am at Sheldon High School at 2455 Willakenzie Road, Eugene, OR 97401, followed by Mandatory Walk-Throughs at Kelly Middle School, 850 Howard Avenue, Eugene, OR 97404, Education Center, 200 North Monroe Street, Eugene OR 97402, and Churchill High School at 1850 Bailey Hill Road, Eugene, OR 97405. Pre-qualification of Bidders is not required.

Each Bid must be submitted on the prescribed form and accompanied by a Surety Bond, Cashiers Check, or Certified Check, executed in favor of Eugene School District 4J, in the amount not less than ten percent (10%) of the total bid, based upon the total bid amount for those items bid upon.

Either with the Bid or within two working hours of the Deadline for Submission of Bids, bidders shall submit, on the form provided, information for first-tier subcontractors furnishing labor or labor and materials, as provided in ORS 279C.370. Bids for which disclosure forms are required, but not submitted, will be rejected.

No bid for a construction contract will be received or considered unless the Bidder is registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board at the time the Bid is made, as required by OAR 137-049-0230.

For every bid $100,000 or greater, all Contractors and Subcontractors shall have a public works bond, in the amount of $30,000, filed with the Construction Contractors' Board (CCB), before starting work on the project, unless exempt. A copy of the Contractor's BOLI Public Works Bond shall be provided with the executed contract documents.

Each Bid shall contain a statement indicating whether the Bidder is a "resident bidder", as defined in ORS 279A.120.

Each Bid shall contain a statement that the "Contractor agrees to be bound by and will comply with the provisions of ORS 279C.800 through 279C.870 regarding payment of Prevailing Wages".

Contractor shall certify nondiscrimination in obtaining required subcontractors, in accordance with ORS 279A.110(4).

School District 4J reserves the right to (1) reject any or all Bids not in compliance with all public bidding procedures and requirements, (2) postpone award of the Contract for a period not to exceed sixty (60) days from the date of bid opening, (3) waive informalities in the Bids, and (4) select the Bid which appears to be in the best interest of the District.

Date: April 17, 2014

By: Kathi Hernandez, Facilities Management Assistant

Published: Register Guard, Daily Journal of Commerce, ORPIN (Oregon Procurement Information Network)

Posted: School District 4J Administration Office
200 North Monroe
Eugene, OR 97402

END OF INVITATION TO BID

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.01 STANDARD FORM

A. "Instructions to Bidders"' AIA Document A701, 1997 Edition, immediately following are part of this Project Manual.

END OF SECTION

AIA® Document A701™ – 1997

Instructions to Bidders

for the following PROJECT:
(Name and location or address)
4J Multisite Roofing 2014
Churchill High School, 1850 Bailey Hill Road, Eugene, OR 97405
Sheldon High School, 2455 Willakenzie Road, Eugene, OR 97401
Kelly Middle School, Eugene, OR 97404

THE OWNER:
(Name, legal status and address)
Eugene School District 4J
715 West 4th Street
Eugene, OR 97402

THE ARCHITECT:
(Name, legal status and address)
Robertson Sherwood Architects pc
132 East Broadway, Suite 540, Eugene, OR 97401

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

.1 a designation of the Work to be performed with the Bidder's own forces;

.2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and

.3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

SECTION 00 22 13
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

The following Supplementary Instructions to Bidders modify, change from, or add to AIA Document A701 Instruction To Bidders, 1997 Edition. Where any Article of the Instructions to Bidders is modified or any paragraph, subparagraph, or clause thereof is modified or deleted by these Supplementary Instructions to Bidders, the unaltered provisions of that Article, paragraph, subparagraph, or clause shall remain in effect.

1.1 ARTICLE 2 BIDDER'S REPRESENTATIONS

A. Add the following subparagraphs to 2.1.3:

2.1.3.1 Bidders are required to attend any mandatory pre-bid conferences or tours as stated in the Advertisement for Bids. Bidders not attending this pre-bid conference and tour shall be disqualified from bidding. Bidders will be required to sign in at the project site prior to the conference or tour.

2.1.3.2 Bidders are encouraged to visit the site(s) to become familiar with existing conditions. The Owner is not responsible and shall not bear financial burden for oversights made by the Bidder for failure to inspect sites prior to submitting a bid.

2.1.3.3 In all cases, persons wishing to examine the area of work must sign in at the school office prior to visiting the work area. Prior to leaving the school, sign-out at the office is required.

2.1.3.4 If access is required at times when the school office is not staffed, contact the Facilities Office, 687-3259, for assistance.

B. Add the following paragraph 2.1.5:

2.1.5The Bidder certifies by signing the Bid that the Bidder has a drug-testing program in place for its employees that includes, at a minimum, the following:

.1 A written employee drug-testing program,

.2 Required drug testing for all new Subject Employees, or alternatively, requiring testing of Subject Employees every six months on a random selection basis,

.3 Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs, and

.4 Required testing of a Subject Employee when the Subject Employee is involved in: (I) an incident causing an injury requiring treatment by a physician, or (ii) an incident resulting in damage to property or equipment.

A drug-testing program that meets the above requirements will be deemed a "Qualifying Employee Drug-testing Program". For purposes of this rule an employee is a "Subject Employee" only if that employee will be working on the Project job site; and

That if awarded the Public Improvement Contract, the Bidder will execute a contract in which the Contractor shall represent and warrant to the District that the Qualifying Employee Drug-testing Program is in place at the time of contract execution and will continue in full force and effect for the duration of the Public Improvement Contract; and that the Contract will condition the Agency's performance obligation upon the Contractor's compliance with this representation and warranty; and

That the Public Improvement Contract shall contain Contractor's covenant requiring each subcontractor providing labor for the Project to:

.1 Demonstrate to the Contractor that it has a Qualifying Employee Drug-testing Program for the subcontractor's Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug-testing Program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract; or

.2 Require the subcontractor's Subject Employees to participate in the Contractor's Qualifying Employee Drug-testing Program for the duration of the subcontract.

1.2 ARTICLE 3 BIDDING DOCUMENTS

A. 3.3 SUBSTITUTIONS

1. Add the following:

3.3.2.1 All requests for approval must be submitted in duplicate on "Substitution Request Form". Include a self-addressed stamped envelope. Requests received by Architect less than six (6) days prior to bid will not be considered.

B. 3.4 ADDENDA

1. Delete paragraph 3.4.1 and substitute the following:

3.4.1 Addenda will be issued by electronic email to plan centers listed in the Advertisement for Bids and all firms listed on the Planholder List.

1.3 ARTICLE 4 BIDDING PROCEDURES

A. 4.1 PREPARATION OF BIDS

1. Add the following Paragraphs:

4.1.8 Bidders shall certify to non-collusion practices on the form included as part of the Bid Form, to be submitted with the Bid Form.

.1 A Non-Collusion Affidavit is required for any contract awarded pursuant to the bid. According to the Oregon Public Contracts and Purchasing Laws, a public contracting agency may reject any or all bids upon a finding of the agency that it is in the public interest to do so (ORS 279C.395). This agency finds that it is in the public interest to require the completion of this affidavit by potential contractors.

.2 The Non-Collusion Affidavit must be executed by the member, officer or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

.3 Bid rigging and other efforts to restrain competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation approval or submission of the bid.

.4 In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an Affidavit must be submitted separately on behalf of each party.

.5 The term "complementary bid" as used in the Affidavit has the meaning commonly associated with the term in the bidding process, and includes the knowing submission of bids higher than the bid of another firm, any intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

.6 Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

4.1.9 Bidders shall certify to non-discrimination in employment practices on the form, included as part of the Bid Form, to be submitted with the Bid Form. By submitting its bid, the Bidder certifies conformance to the applicable federal acts, executive orders, and Oregon statutes and regulations concerning affirmative action toward equal employment opportunities. All information and reports required by the federal or Oregon state governments having responsibility for the enforcement of such laws shall be supplied to the Owner in compliance with such acts, regulation, and orders.

4.1.10 Bidder shall indicate, on the Bid Form where provided, the bidder's status as a "resident" or "non-resident" in accordance with ORS 279C.365 and ORS 279A.120.

4.1.11 First-Tier Subcontractor Disclosure:

.1 Within two working hours after the date and time of the deadline when the bids are due, a Bidder shall submit to the District a disclosure of the first-tier subcontractors that will be furnishing labor or will be furnishing labor and materials in connection with the public improvement; and will have a contract value that is equal to or greater than 5% of the project bid or $15,000, whichever is greater, or $350,000, regardless of the percentage of the total project bid.

.2 The disclosure of first–tier subcontractors shall include the name of each subcontractor, the category of work that the subcontractor would be performing, and the dollar value of each subcontract.

.3 The first-tier subcontractor disclosure applies only to public improvements with a contract value of more than $100,000.

.4 The District will consider the bid of any contractor that does not submit a required subcontractor disclosure to the District to be a non-responsive bid. A non-responsive Bid will not be considered for Award.

.5 Contractor shall certify that all subcontractors performing Work are registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board in accordance with ORS 701.035 to 701.055 before the subcontractors commence work under the Contract.

B. 4.2 BID SECURITY

1. Delete paragraphs 4.2.2 and 4.2.3 and substitute the following:

4.2.2 Each Bid shall be accompanied by a surety bond, cashiers check, or certified check, executed in favor of Eugene School District 4J, in the amount not less than ten percent (10%) of the total bid, based upon the total bid amount for those items bid upon. Should the Bidder refuse to enter into such Contract or fail to furnish Performance and Labor and Materials Payment Bonds and Certificates of Insurance as required by the Supplementary Conditions within ten (10) working days after contract forms are provided to the Bidder, the amount of the Bid Security may be forfeited to the Owner as liquidated damages, not as a penalty.

.1 The Surety Bond shall be written by a Bonding Company authorized and licensed by the Oregon Insurance Commissioner. The bonding company must be listed on the most current US Government Treasury List, Department Circular 570, or approved PRIOR TO BID SUBMISSION by the Eugene School District 4J's Risk Manager. The Bond shall be on a AIA Document A310, most current edition. The Attorney-in-Fact who executes the Bond on behalf of the Surety shall affix to the Bond, a certified copy of a power of attorney.

.2 The Owner will have the right to retain the Bid Security of Bidders until either; a) the Contract has been executed and Bonds have been furnished, or b) the specified time has elapsed so that Bids may be withdrawn, or c) all Bids have been rejected.

C. 4.4 MODIFICATION OR WITHDRAWAL OF BID

1. Delete paragraph 4.4.1 and substitute the following:

4.4.1 A Bid may not be withdrawn or canceled by the Bidder following the time and date designated for the receipt of bids to the expiration of a 60 day period. The Bid for that sixty days is irrevocable and each Bidder so agrees in submitting a Bid.

1.4 ARTICLE 6 POST-BID INFORMATION

A. Delete Paragraph 6.1.

B. Modify paragraph 6.3.1 as follows:

In the first sentence delete the phase "as soon as practicable" and add "within 48 hours."

C. Add the following:

6.3.1.4 Where asbestos abatement is required, Contractor or appropriate subcontractor shall be licensed by the Department of Environmental Quality to perform "asbestos abatement work", per OAR 340-248-0120, Adopted 1/25/90, and meet requirements of AHERA as specified in the Federal Register, 40 CFR part 763. Bidder shall submit evidence of licensing to Owner.

1.5 ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

A. 7.1 BOND REQUIREMENTS

1. Delete paragraphs 7.1.1, 7.1.2 and 7.1.3 and add the following:

7.1.1 Unless otherwise stated in the solicitation document, the successful Bidder shall be required to provide the Owner with a Performance Bond and Labor and Material Payment Bond, **each** in an amount equal to one hundred (100%) of the contract sum. The Surety Company shall meet requirements as specified in the Supplementary Conditions.

7.1.2 The Labor and Material Payment Bond shall contain a clause specifically guaranteeing payment of all sums of money withheld from employees and payable to the Internal Revenue Service; and all contributions or amounts due to the State of Oregon from the General Contractor or subcontractor incurred in the performance of this contract.

7.1.3 The Bond shall be fully executed, payable to the Owner.

7.1.4 The cost of these bonds shall be included in the Bid.

1.6 7.2 TIME OF DELIVERY AND FORM OF BONDS

A. Delete paragraph 7.2.1 and substitute the following:

7.2.1 The successful Bidder will be provided with contract forms through the Architect. These forms shall be executed and delivered to the Owner, along with Performance Bond and Labor and Material Payment Bond, within ten (10) days after receiving forms.

1.7 7.3 BOLI PUBLIC WORKS BOND

A. Add the following paragraph:

7.3 Pursuant to ORS 279C.836, for any contract awarded where the contract price is $100,000.00 or greater, the Contractor and every subcontractor shall have a Public Works bond filed with the Construction Contractors Board before starting work on the project. This bond is in addition to performance bond and payment bond requirements. A copy of the Contractor's BOLI Public Works Bond shall be provided with the executed contract."

1.8 ARTICLE 9 MISCELLANEOUS PROVISIONS

A. Add the following article:

ARTICLE 9 MISCELLANEOUS PROVISIONS

9.1 ADMINISTRATIVE RULES

All bidders are required to comply with the provisions of Oregon Revised Statutes and 4J Board Policy. Attention is directed to ORS 244, Government Ethics; ORS 279A and 279C, Pubic Contracting Code; Oregon Administrative Rules, Chapter 137, Divisions 46, 48 and 49; and 4J Board Policy DJC.

9.2 PROTEST OF BID

Protests of bid specifications or contract terms shall be presented to the Owner in writing five (5) calendar days prior to bid opening. Such protest or request for change shall include the reason for protest or request, and any proposed changes to specifications or terms. No protest against award because of the content of bid specifications or contract terms shall be considered after the deadline established for submitting such protest.

9.3 PROTEST OF AWARD

Any actual bidder or proposer who is adversely affected by the Owner's notice of award of the contract to another bidder or proposer on the same solicitation shall have seventy two (72) hours from the notice of award to submit to the Owner, a written protest of the notice of award. In order to be an adversely affected or aggrieved bidder or proposer with a right to submit a written protest, a bidder or proposer must itself claim to be eligible for award of the contract as the lowest responsible bidder or best proposer and must be next in line for award.

9.4 FINAL AWARD

The written notice of award of the contract shall constitute a final decision of the Owner to award the contract if no written protest of the notice of award is filed with the Owner within the designated time.

END OF DOCUMENT 00 22 13

SECTION 00 41 13
BID FORM

BID FOR: Multisite Roofing 2014 CIP Number: 420.780.209

Submitted to: Facilities Management
Eugene School District 4J
715 West Fourth Avenue3
Eugene, Oregon 97402

Bid Deadline: 2:00 PM
May 13, 2014

Submitted by: _____
(Company Name)

BID
The undersigned proposes to furnish all material, equipment, and labor required for the complete project, and to perform all work in strict accordance with the Contract Documents for the lump sum prices indicated below with completion occurring on or prior to the dates indicated:

Bid: _____ $ _____
(Words) (Figures)

The undersigned agrees, if awarded the Contract, to substantially complete all work on or before the dates specified in Section 01 11 00.

BID SECURITY
Accompanying herewith is Bid Security, which is not less than ten percent (10%) of the total amount of the Base Bid plus additive alternates.

STIPULATIONS
The undersigned acknowledges the liquidated damages provision included in the Supplementary Conditions.

The undersigned agrees, if awarded the contract, to comply with the provisions of Oregon Revised Statutes 279C.800 through 279C.870 pertaining to the payment of prevailing rates of wage.

The undersigned agrees, if awarded the Contract, to execute and deliver to the Owner within ten (10) working days after receiving contract forms, an Agreement and a satisfactory Performance Bond and Payment Bond each in an amount equal to 100 percent (100%) of the Contract Sum.

For every Agreement of $1000,000 or greater in value, all Contractors and Subcontractors shall have a public works bond in the amount of $30,000, filed with the Construction Contractors' Board (CCB), in compliance with ORS 279C.836, before starting work on the project unless exempt. Contractor agrees to provide a copy of the Contractor's BOLI Public Works bond with the signed Agreement as Specified in the Supplementary Conditions.

The undersigned agrees that the Bid Security accompanying this proposal is the measure of liquidated damages which the Owner will sustain by the failure of the undersigned to execute and deliver the above named agreement and bonds; and that if the undersigned defaults in executing that agreement within ten (10) days after forms are provided or providing the bonds, then the Bid Security shall become the property of the Owner; but if this proposal is not accepted within sixty (60) days of the time set for the opening of bids, or if the undersigned executes and delivers said agreement and bonds, the Bid Security shall be returned.

By submitting this Bid, the Bidder certifies that the Bidder:
a) has available the appropriate financial, material, equipment, facility and personnel resources and expertise, or the ability to obtain the resources and expertise, necessary to meet all contractual responsibilities;
b) has a satisfactory record of past performance;
c) has a satisfactory record of integrity, and is not disqualified under ORS 279C.440;
d) is qualified legally to contract with the Owner; and
e) will promptly supply all necessary information in connection with any inquiry the Owner may make concerning the responsibility of the Bidder.

Prior to award of a Contract, the Bidder shall submit appropriate documentation to allow the Owner to determine whether or not the Bidder is "responsible" according to the above criteria.

The contractor agrees with the provisions of Oregon Revised Statutes 279C.505, which requires that the contractor shall demonstrate it has established a drug-testing program for employees and will require each subcontractor

providing labor for the Project to do the same.

The undersigned has received addenda numbers _____ to _____ inclusive and has included their provisions in the above Bid amounts.

The undersigned has visited the site to become familiar with conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

The undersigned certifies that the Bidder is a _____ Bidder under ORS. ("Resident" or "Non-resident", to be filled in by Bidder)

Names of Firm: _____

Street Address: _____
(City) (State) (Zip)

Telephone Number: _____ FAX Number: _____

Email Address: _____

Signed By: _____ Printed Name:_____
(Signature of Authorized Official. If bid is from a partnership, one of the partners must sign bid).

Date Signed: _____

Official Capacity: _____

If corporation, attest: _____ Date: _____
(Secretary of Corporation)

SEAL (If Corporate)

_____ Corporation
_____ Partnership
_____ Individual

Enclosed: Bid Security, Non-Discrimination Requirement, Non-Collusion Affidavit, First-Tier Subcontractor Disclosure Form

NON-DISCRIMINATION REQUIREMENT

Contractor certifies that the Contractor has not discriminated against minorities, women or emerging small business enterprises in obtaining any required subcontracts.

The Contractor agrees not to discriminate against any client, employee, or applicant for employment or for services, because of race, color, religion, sex, national origin, physical or mental handicap, sexual orientation or age, unless based upon bona fide occupational qualifications, and that they are otherwise in compliance with all federal, state and local laws prohibiting discrimination, with regard to, but not limited to, the following: Employment upgrading, demotion or transfer; Recruitment or recruitment advertising; Layoffs or termination; Rates of pay or other forms of compensation; Selection for training; Rendition of services. It is further understood that any vendor who is in violation of this clause shall be barred forthwith from receiving awards of any purchase order from the School District, unless a satisfactory showing is made that discriminatory practices have terminated and that a recurrence of such acts is unlikely.

FIRM NAME _____

ADDRESS _____

TELEPHONE _____

BY _____
(Company or Firm Officer)

BY _____
(Type or Print Name)

NON-COLLUSION AFFIDAVIT

STATE OF _____)

County of _____)

I state that I am _____ of _____
(Title) (Name of Firm)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder, expect as disclosed on the attached appendix.

(2) That neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or noncompetitive bid.

(5) _____, its affiliates, subsidiaries, officers, directors and
(Name of my Firm)

employees are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described on the attached appendix.

I state that _____ understands and acknowledges that the above representations
(Name of my Firm)

are material and important, and will be relied on by School District 4J in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from School District 4J of the true facts relating to the submission of bids for this contract.

_____
(Authorized Signature)

Sworn to and subscribed before me this _____ day of _____, 2014

_____
(Notary Public for Oregon)

My Commission Expires: _____

END OF BID FORM

SECTION 00 45 22
FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT: Multisite Roofing 2014 **CIP NUMBER: 420.780.209**

TO: Kathi Hernandez, Facilities Management Assistant
Eugene School District 4J
715 West Fourth Avenue
Eugene, Oregon 97402

BID SUBMISSION DEADLINE: Date: May 13, 2014 Time: 2:00 PM

SUBMITTAL REQUIREMENTS
Subcontractor disclosure is required on all public improvement contracts greater than $100,000.

This form must be submitted at the location specified in the Invitation to Bid on the advertised bid closing date and within two working hours after the advertised bid closing time.

List below the name of each subcontractor that will be furnishing labor or labor and materials, and that is required to be disclosed, the category of work that the subcontractor will be performing, and the dollar value of the subcontract. Enter "NONE" if there are no subcontractors that need to be disclosed. (ATTACH ADDITIONAL SHEETS IF NEEDED.)

SUBCONTRACTOR	DOLLAR VALUE	CATEGORY OF WORK

The above listed first- tier subcontractor(s) are providing labor, or labor and material, with a Dollar Value equal to or greater than:

a) 5% of the total Contract Price, but at least $15,000. [If the Dollar Value is less than $15,000 do not list the subcontractor above.]
b) $350,000 regardless of the percentage of the total Contract Price

Failure to submit this form by the disclosure deadline will result in a non-responsive bid. A non-responsive bid will not be considered for award.

Form submitted by (Bidder Name): _____

Contact Name: _____ **Phone:** _____

Signature: _____

END OF DOCUMENT

SECTION 00 52 13
FORM OF AGREEMENT

PART 1 GENERAL

1.01 STANDARD FORM

A. The form of Agreement will be executed on AIA Form A 101, Standard Form of Agreement Between Owner and Contractor, 2007 Edition, a copy of which is included by reference. Copies are available for review at the office of Facilities Management, School District 4J.

END OF DOCUMENT

SECTION 00 72 13
GENERAL CONDITIONS

PART 1 GENERAL

1.01 STANDARD FORM

A. "General Conditions of the Contract for Construction" AIA Document A-201, 2007 Edition, immediately following, are part of these specifications.

B. The Contractor and all Subcontractors shall read and be governed by them.

1.02 CONFLICTS

A. In the case of conflicts between the "General Conditions" and these Specifications, the Specifications govern.

END OF DOCUMENT

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
4J Multisite Roofing 2014
Churchill High School, 1850 Bailey Hill Road, Eugene, OR 97405
Sheldon High School, 2455 Willakenzie Road, Eugene, OR 97401
Kelly Middle School, Eugene, OR 97404

THE OWNER:
(Name, legal status and address)
Eugene School District 4J
715 West 4th Street
Eugene, OR 97402

THE ARCHITECT:
(Name, legal status and address)
Robertson Sherwood Architects pc
132 East Broadway, Suite 540, Eugene, OR 97401

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

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(Topics and numbers in bold are section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

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

§ 1.1.2 THE CONTRACT

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

§ 1.1.3 THE WORK

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

§ 1.1.4 THE PROJECT

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

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

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

§ 1.1.7 INSTRUMENTS OF SERVICE

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

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

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

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

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

§ 1.3 CAPITALIZATION

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

§ 1.4 INTERPRETATION

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

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

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

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

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

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

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

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

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

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

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

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

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

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

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

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

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

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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

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

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

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

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

§ 3.5 WARRANTY

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

§ 3.6 TAXES

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

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

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

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

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

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume

the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 SUPERINTENDENT

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

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

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

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

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

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

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

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

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

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

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

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

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

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

required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

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

§ 3.14 CUTTING AND PATCHING

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

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

§ 3.15 CLEANING UP

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

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

§ 3.16 ACCESS TO WORK

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

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

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

§ 3.18 INDEMNIFICATION

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

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

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

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

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

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

§ 4.2 ADMINISTRATION OF THE CONTRACT

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

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

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

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

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

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

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

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

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

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

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

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

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

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

§ 5.3 SUBCONTRACTUAL RELATIONS

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

be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

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

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

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

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

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

§ 6.2 MUTUAL RESPONSIBILITY

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

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

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

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

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

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

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

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

§ 7.2 CHANGE ORDERS

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

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

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

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

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

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

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

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

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

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

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

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

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

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

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

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

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

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

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

§ 8.2 PROGRESS AND COMPLETION

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

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

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.2 SCHEDULE OF VALUES

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

§ 9.3 APPLICATIONS FOR PAYMENT

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

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

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

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

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

§ 9.4 CERTIFICATES FOR PAYMENT

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

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or a separate contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

§ 9.6 PROGRESS PAYMENTS

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

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

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

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

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

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

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

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect,

stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

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

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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

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

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

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

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

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

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

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

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

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

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

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

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

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

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

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

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

§ 10.4 EMERGENCIES

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage;
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations; and
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction

of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

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

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or

otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the

Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

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

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

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

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

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

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

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

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

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

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

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

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

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

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

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

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

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

§ 13.6 INTEREST

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

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

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

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

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

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

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

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

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

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

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

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

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

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

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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

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

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

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

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

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

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

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

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

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

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

§ 15.4 ARBITRATION

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

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

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

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

§ 15.4.4 CONSOLIDATION OR JOINDER

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

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an

additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

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

DOCUMENT 00 73 40
SUPPLEMENTARY CONDITIONS
FOR GENERAL CONDITIONS FOR THE CONTRACT FOR CONSTRUCTION

PART 1 GENERAL

The following supplements modify, change, delete from or add to AIA Document A201, General Conditions of the Contract for Construction 2007 Edition. Where any part of the AIA General Conditions is amended, voided, or superseded by the Supplementary Conditions, the unaltered provisions shall remain in effect.

1.1 ARTICLE 1 GENERAL PROVISIONS

A. BASIC DEFINITIONS

1. Add the following Subparagraphs:

1.1.9 ARCHITECT/ENGINEER

Where the term ARCHITECT is used in the Bidding documents, Contract documents, Addenda, Change Orders or other documents related to this contract it shall be defined as either "Architect" or "Engineer" depending upon which design professional has prepared the document in question. When the project has been designed and initiated under the direction of a licensed engineer, the term ENGINEER shall be substituted for the term "Architect" throughout all documents.

1.1.10 MISCELLANEOUS DEFINITIONS

.1 "Provide:" Furnish and install, or furnish labor and materials required for installation, ready for use and in accordance with the Contract Documents.

.2 "As shown:" As indicated, as detailed, as noted, or words of similar import refer to Contract Documents.

.3 "Selected:" As selected by the Architect.

.4 "Approved: "Approved by Architect.

.5 "For Approval: "For the Architect's approval.

B. CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1. Add the following to Subparagraph 1.2.1:

1.2.1.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities.

1. The Agreement.
2. Addenda, with those of later date having precedence over those of earlier date.
3. The Supplementary Conditions.
4. The General Conditions of the Contract for Construction.
5. Division 1 of the Specifications.
6. Drawings and Divisions 2- 49 of the Specifications.

In the case of conflicts or discrepancies between Drawings and Divisions 2- 49 of the Specifications or within either Document not clarified by Addendum, the Architect will determine which takes precedence in accordance with Subparagraph 4.2.11.

2. Add the following Subparagraphs:

1.2.4 If work is required in such a manner to make it impossible to produce first class work or should discrepancies appear among Contract Documents, request interpretation before proceeding with work. If Contractor fails to make such request, the Contractor will thereafter be expected to carry out work in satisfactory manner.

1.2.5 Reference to codes, standard specifications, or other standards means and intends latest edition of such documents and/or adopted as of bid date. Where brand name products are specified and no installation instructions given herein, install product in accordance with the manufacturer's specifications and instructions, latest edition.

1.2.6 No provision of any reference standard specification, manual or code shall change the privileges or responsibilities of Owner, Architect, or Contractor, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Architect, or any of Architect's 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 provision of the Contract Documents.

1.2.7 Sections of Division 1, General Requirements govern the execution of all sections of the specifications.

1.2 ARTICLE 2 OWNER

A. 2.1 GENERAL

1. Add the following Subparagraph:

2.1.3 The Owner is the Eugene School District 4J, 200 North Monroe Street, Eugene, Oregon 97402, (541) 790-7417.

The Owner's representative is Don Philpot, (541) 790-7430, 715 West Fourth Avenue, Eugene, OR 97402.

B. INFORMATION AND SERVICES REQUIRED OF THE OWNER

1. Delete Subparagraph 2.2.5 and substitute the following:

2.2.5 The Contractor will be furnished free of charge up to 5 copies of the Contract Documents. The Owner will furnish additional copies requested by the Contractor at the cost of reproduction, postage and handling.

1.3 ARTICLE 3 CONTRACTOR

A. 3.1 GENERAL

1. Delete the second sentence to Subparagraph 3.1.1, and add the following:

The Contractor and each subcontractor shall maintain for the duration of the Project a registration with the Oregon State Construction Contractor's Board.

2. Add the following Subparagraph 3.1.4

3.1.4 The Contractor is required to demonstrate that an employee drug testing program is in place.

3. Add the following Subparagraph 3.1.5

3.1.5 The Contractor certifies that the Contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this Contract by any Federal department or agency. If requested by the Eugene 4J School District, the Contractor shall complete a Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion form. Any such form completed by the Contractor for this Contract shall be incorporated into this Contract by reference.

B. 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

1. Delete the last sentence to Subparagraph 3.2.4, and add the following:

If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

C. 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

1. Add the following Subparagraphs:

3.3.4 The Contractor shall review with all Subcontractors, construction means, methods and materials to be used to verify their compliance with all safety standards and laws and be responsible for compliance with same to insure safe, hazard free conditions for all persons visiting or working on the entire project.

3.3.5 The Contractor shall comply with the provisions of Oregon Revised Statutes and 4J Board Policy. Attention is directed to ORS 279A and 279C, Public Contracting Code.

D. 3.4 LABOR AND MATERIALS

1. Add the following Subparagraphs:

3.4.4 PAYMENT OF LABORERS AND MATERIALMEN, CONTRIBUTIONS TO INDUSTRIAL ACCIDENT FUND, LIENS AND WITHHOLDING TAXES: The Contractor shall: (1) Make payment promptly, as due, to all persons supplying to such contractor labor or material for the prosecution of the Work provided for in such contract. (2) Pay all contributions or amounts due the Industrial Accident Fund from such Contractor or subcontractor incurred in the performance of the contract. (3) Not permit any lien or claim to be filed or prosecuted against the state, county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished. (4) Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

3.4.5 HOURS OF LABOR: No person shall be employed for more than ten hours in any one day, or 40 hours in any one week, except in the cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the person so employed shall be paid at least time and a half of the regular pay for all time worked.

.1 For all overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; or

.2 For all overtime in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and

.3 For all work performed on Saturday and on any legal holiday specified in ORS 279C.540.

.4 Worker claims for overtime, in order to be considered, must be filed with the Contractor within 90 days from the completion of the contract, in accordance with ORS 279C.545.

The Contractor shall give notice to employees who work on a public contract in writing, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week the employees may be required to work.

3.4.6 PAYMENT FOR MEDICAL CARE AND PROVIDING WORKERS' COMPENSATION: The Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service. All employers working under this contract are subject employers and must comply with ORS 656.017.

3.4.7 PREVAILING WAGE RATES: Each worker in each trade or occupation employed in the performance of this Contract either by the contractor, subcontractor or other person doing or contracting to do contracting for the whole or any part of the Work on the Contract shall be paid not less than the applicable state or federal prevailing rate of wage. This provision applies to all contracts, regardless of the price of the individual contract.

a. The existing BOLI prevailing rates of wage in effect at the time the specifications are first advertised for bid solicitations is the applicable rate.

b. The Owner will pay the public works fee to Oregon Bureau of Labor and Industries.

c. Certification of rate or wage by Contractor or Subcontractor (ORS 279C.845):

.1 The contractor or the contractor's surety and every subcontractor or the subcontractor's surety shall file certified statements with the public agency in writing, on a form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker whom the contractor or the subcontractor has employed upon the public works, and further certifying that no worker employed upon the public works has been paid less than the higher of the applicable state or federal prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract. The certificate and statement shall be verified by the oath of the contractor or the contractor's surety or subcontractor or the subcontractor's surety that the contractor or subcontractor has read the statement and certificate and knows the contents thereof and that the same is true to the contractor or subcontractor's knowledge. The certified statements shall set out accurately and completely the payroll records for the prior week, including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid.

.2 If the Contractor does not file certified payroll as required (at least once per month) the Owner will withhold 25% of the amounts due the Contractor, in addition to any other required retainage.

.3 If a first-tier Subcontractor does not file certified payroll reports as required, the prime Contractor shall withhold 25% of amounts due the first-tier Subcontractor.

.4 Each certified statement required by subsection (1) of this section shall be delivered or mailed by the contractor or subcontractor to the public contracting agency. Certified statements shall be submitted to the public contracting agency once a month by the fifth business day of the following month, for each week workers are employed. Information submitted on certified statements may be used only to ensure compliance with the provisions of ORS 279C.800 to 279C.870.

.5 Each contractor or subcontractor shall preserve the certified statements for a period of three years from the date of completion of the contract.

.6 Certified statements received by a public agency are public records subject to the provisions of ORS 192.410 to 192.505. As such, they must be made available upon request.

3.4.8 PAYMENT OF CLAIMS BY PUBLIC OFFICERS: If the Contractor fails, neglects or refuses to make prompt payment of any claims for labor or services furnished to the Contractor or a subcontractor by any person in connection with this Contract as such claim becomes due, the Owner may pay such claim and charge the amount of the payment against funds due or to become due the Contractor by reason of this Contract.

3.4.9 PAYMENT FOR MEDICAL CARE AND PROVIDING WORKERS' COMPENSATION: The Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

3.4.10 Any person owed for labor or material by a subcontractor or Contractor may file a complaint with the Construction Contractors Board in accordance with ORS 279C.515(3).

E. 3.7 PERMITS, FEES AND NOTICES

1. Delete Subparagraph 3.7.1, and substitute the following:

3.7.1 The OWNER will pay the plan check fee, building permit fee, and systems development

charges directly to the authority having jurisdiction. The CONTRACTOR shall pay for all other permits, fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded. The Contractor shall pick up permits and call for inspections through final inspection, as required by the City Building Department.

F. 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1. Add the following to Subparagraph 3.12.5:

   Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

2. Add the following to Subparagraph 3.12.9:

   Shop drawings that are submitted to the Architect for review do not constitute "in writing" unless it is brought to the attention of the Architect, in written form, that specific changes are being suggested. In any event, changes to the contract documents by means of shop drawings become the responsibility of the person initiating such changes.

G. 3.18 INDEMNIFICATION

1. Delete Subparagraph 3.18.1, and substitute the following:

   13.18.1 To the fullest extent of the law, the Contractor will defend, indemnify, hold harmless and reimburse the Eugene School District 4J (including its officers, board members, agents, and employees) from all claims, demands, suits, actions, penalties, and damage expenses, for liability of any kind including attorney's fees. To the extent that death or bodily injury to persons or damage to property arises out of the fault of the Contractor, the Contractor's indemnity obligation exists only to the extent that the death or bodily injury to persons or damage to property arises out of the fault of the Contractor, or the fault of the Contractor's agents, representatives or subcontractors, contributed to or caused such damage, whether or not such incidents are contributed to or caused in any part by Eugene School District 4J.

1.4 ARTICLE 4 ARCHITECT

A. 4.1 GENERAL

1. Modify Paragraph 4.1.1

   a. In the first sentence delete "shall retain" and insert "may have retained" in it's place.

   b. Add sentence: "The term "Architect" means the Architect or the Architect's authorized representative."

2. Add the following to Subparagraph 4.1.2:

   Written consent of the Contractor shall only apply to those items which directly or indirectly affect the work of the Contractor.

3. Add the following Subparagraph:

   In the first sentence delete "shall" and insert "may" in its place.

4. Add the following Subparagraph:

   4.1.4 The Architect is defined as:

   Robertson/Sherwood/Architects pc

   132 E. Broadway, Suite 540

   Eugene, OR 97401

   (541) 342-8077

   (541) 345-4302 (Fax)

B. 4.2 ADMINISTRATION OF THE CONTRACT

1. Add the following sentence to 4.2.1:

   The architect may be retained to administer the Contract through the specified period for correction of the Work described in Section 12.2

2. Add the following to Subparagraph 4.2.4:

   4.2.4.1 The Owner may communicate directly with the Contractor when necessary or appropriate. The Owner may give direction to the Contractor in matters related to access to the site, coordination with Owner's occupancy and use by the public, use of parking and staging areas, use of potentially hazardous products, drug and alcohol policy, no smoking policy, appropriate dress and behavior, safety requirements and safe work practices, where appropriate. The Owner will advise the Architect regarding any communication with or direction given to the Contractor.

   4.2.4.2 Representatives of the Owner, Contractor and Architect shall meet periodically at mutually agreed-upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationships which may otherwise exist. Nothing in this agreement shall give the Architect the authority to make decisions or give direction without the Owner's concurrence.

3. Add the following to Subparagraph 4.2.9:

   4.2.9.1 The Architect will make one inspection for the determination of Substantial Completion and one for determination of Final Acceptance. Such inspections will be made only after receipt of written notification of readiness for such inspections from Contractor.

   4.2.9.2 Should additional inspections beyond those listed in 4.2.9.1 be required due to Contractor's failure to satisfactorily complete all work, the Contractor shall become responsible for all costs incurred by the Owner in conjunction with required re-inspections. A deductive Change Order shall be prepared using the following hourly rates as the basis for calculating the amounts to be deducted:

Architect/Engineer:	$100 per hour
District 4J Personnel:	$ 75 per hour

   4.2.9.3 The amount to be deducted from the Contract shall be calculated by multiplying the hours expended in additional inspections and documentation by the hourly rates listed in 4.2.9.2.

4. Add the following sentence to Subparagraph 4.2.11:

   The architect's response will be within 10 days of receipt of written requests from the Owner or Contractor.

5. Delete Subparagraph 4.2.13, and substitute the following:

   4.2.13 Decisions on matters related to aesthetic effect will be made collaboratively between the Owner and the Architect. The final decision shall be the Owner's, if consistent with the intent expressed in the Contract Documents.

6. Add the following sentence to Subparagraph 4.2.14

   The architect's response will be within 10 days of receipt of written requests from the Owner or Contractor.

1.5 ARTICLE 5 SUBCONTRACTORS

A. 5.3 SUBCONTRACTUAL RELATIONS

1. Add the following Subparagraphs:

   5.3.1 The Contractor shall include in each subcontract for property or services entered into by the Contractor and a subcontractor, including a material supplier, for the purpose of

performing a construction contract:

.1 A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to the Contractor by the owner under such contract; and

.2 An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph .1 of this section for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; computed at the rate specified in ORS 279C.580.

5.3.2 The Contractor shall include in each of its subcontracts, for the purpose of performance of such contract condition, a provision requiring the subcontractor to include a payment clause and an interest penalty clause conforming to the requirements of Subparagraph 5.3.1 in each of its subcontracts and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

1.6 ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No modifications.

1.7 ARTICLE 7 CHANGES IN THE WORK

A. 7.1 GENERAL

1. Paragraph 7.1.2, delete the following: "an order for minor changes in the Work can be issued by the Architect alone".

2. Add the following Subparagraph 7.1.4 to Paragraph 7.1:

7.1.4 The combined overhead and profit included in the total cost or credit to the Owner of a change in the Work shall not exceed that stated in 7.1.4.4 below. In no case shall the Contractor's or Subcontractors individual overhead and profit request exceed the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, 15 percent of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractors, 10 percent of the amount due the Subcontractors.

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, 10 percent of the cost.

.4 The **Base Cost** to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7., articles .1, .2, .3, .4, and .5. To this **Base Cost** is added the applicable overhead and profit. In no case shall the combined overhead and profit (including all Contractor and Subcontractor(s) overhead and profit) exceed 25 percent of this **Base Cost**.

.5 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including those applicable costs from paragraph 7.3.7, .1-.5, and Subcontractor and Contractor overhead and profit as applicable.

.6 Cost of preparing change order shall not be included in cost of Change Order.

3. Add the following Subparagraph 7.1.5 to Paragraph 7.1:

7.1.5 A Change Order providing a CREDIT to the Owner shall include a credit for overhead and profit based on the following schedule:

.1 For the Contractor, 5 percent of the Cost to be credited.

.2 For each Subcontractor, 5 percent of the Cost to be credited.

.3 For each Sub-subcontractor, 5 percent of the Cost to be credited.

.4 All other provisions of Subparagraph 7.1.4 shall apply to Credit Change Orders.

B. 7.3 CONSTRUCTION CHANGE DIRECTIVES

1. Add the following to Subparagraph 7.3.1:

   For the purposes of this Agreement, The Owner's "CHANGE REQUEST/PROCEED ORDER" may be substituted for and used interchangeably with "CONSTRUCTION CHANGE DIRECTIVE".

2. Modify Subparagraph 7.3.7 as follows:

   In the first sentence, delete the words "a reasonable amount." and substitute "an amount for overhead and profit in accordance with Paragraph 7.1.4 or 7.1.5."

3. Delete Subparagraph 7.3.7.1 and substitute the following:

   7.3.7.1 The maximum allowable hourly wage rate for Changes to the Work shall be the appropriate Base Wage Rate plus Fringe Rate as listed for each occupation in the Prevailing Wage Rate for Public Works Contracts in Oregon manual issued by the Oregon Bureau of Industries; multiplied by 1.20. An amount for Overhead and Profit may be added in accordance with Paragraph 7.1.4 or 7.1.5.

4. Delete 7.3.7.3, and substitute the following:

   7.3.7.3 Rental costs of machinery and equipment, exclusive of hand tools and motor vehicles, when rented from the Contractor or others;

5. Change the first sentence of Subparagraph 7.3.8 to read as follows:

   The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost, including overhead and profit according to the schedule in Subparagraph 7.1.5 above.

6. Change the first sentence of Subparagraph 7.3.9 to read as follows:

   Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in the Application for Payment accompanied by an executed Change Order indicating the parties' agreement with part or all of such costs.

1.8 ARTICLE 8 TIME

A. 8.2 PROGRESS AND COMPLETION

1. Add the following Subparagraph 8.2.4

   8.2.4 The Contractor agrees that said work shall be executed regularly, diligently, at such a rate of progress as will insure Substantial Completion thereof within the time specified. It is expressly understood and agreed by and between the Contractor and the Owner that the time for the completion of the work described herein is reasonable taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

1.9 ARTICLE 9 PAYMENT AND COMPLETION

A. 9.2 SCHEDULE OF VALUES

1. Revise the first sentence of Subparagraph 9.2 to read as follows:

   ".... the Contractor shall submit to the Architect and the Owner,....."

2. Add the following sentence to Paragraph 9.2:

   Submit on AIA Document A703, latest edition.

B. 9.3 APPLICATIONS FOR PAYMENT

1. Add the following sentence to Subparagraph 9.3.1:

   The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

2. Delete Clause 9.3.1.1, and substitute the following:

   9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, accompanied by an executed Change Order.

C. 9.5 DECISIONS TO WITHHOLD CERTIFICATION

1. Delete Subparagraph 9.5.3.

D. 9.6 PROGRESS PAYMENTS

1. Add the following Clause to Subparagraph 9.6.1:

   9.6.1.1 After the Architect has issued a certificate for payment and it has been approved by the Owner, the Owner will pay the Contractor 95 percent (95%) of the total value of material and labor incorporated into the project as indicated on the Application for Payment less the aggregate of previous payments. Progress schedule update shall accompany each payment request.

   9.6.1.2 Payment will be made within fifteen (15) days of approval of the Application for Payment by School District 4J ("Progress Payment Due Date").

   9.6.1.3 The first Application for Payment and each subsequent Application for Payment will not be considered complete unless it is accompanied by the certified payroll for the contractor and all subcontractors requesting payment.

2. Add the following Subparagraph to Paragraph 9.6:

   9.6.8 In lieu of cash retainage to be held by the Owner, the Contractor may select one of the following options:

   .1 The Contractor may deposit bonds or securities with the Owner or in any bank or trust company to be held for the benefit of the Owner. In such event, the Owner shall reduce the retainage in an equal amount to the value of the bonds and securities.

   .2 Upon written request of the Contractor, the Owner will deposit any amounts withheld as retainage in an interest-bearing account in a bank, savings bank, trust company or savings association for the benefit of the Owner. Interest earned shall accrue to the Contractor.

   .3 If the Owner incurs additional costs as a result of the exercise of any of the options for retainage described herein, the Owner may recover such costs from the Contractor by reduction of final payment.

E. 9.8 SUBSTANTIAL COMPLETION

1. Delete Subparagraph 9.8.1 and substitute the following:

   9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can fully occupy and fully utilize the Work for its intended use with only minor corrective work remaining which can be accomplished without disruption of the occupants.

2. Delete the last two sentences to Subparagraph 9.8.5 and add the following:

   9.8.5 Upon Substantial Completion of the Work, the Contractor may submit an application for payment in accordance with Subparagraph 9.3.1 in an amount sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Architect determines for incomplete Work or unsettled claims.

F. 9.10 FINAL COMPLETION AND FINAL PAYMENT

1. Add the following Subparagraph to Paragraph 9.10:

9.10.6 The Contractor shall not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished in connection with the Work.

G. Add the following Paragraphs to Article 9:

1. 9.11 LIQUIDATED DAMAGES

9.11.1 The Owner will suffer financial loss if the Work is not Substantially Complete, as defined in Article 9.8.1 above, on the dates specified in Section 01 11 00. The Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sum hereinafter stipulated as fixed, agreed, and liquidated damages for each calendar day of delay until the date established in the Certificate of Substantial Completion.

The agreed amount of liquidated damages is five hundred dollars ($500.00) per each calendar day. The amount of liquidated damages may be reduced in cases of partial occupancy, at the sole discretion of the Owner.

2. 9.12 AGENCY PAYMENT FOR UNPAID LABOR OR SUPPLIES

9.12.1 Contract incomplete. If the Contract is still in force, the Agency may, in accordance with ORS 279C.515, pay a valid claim to the Entity furnishing the labor or services, and charge the amount against payments due or to become due to the Contractor under the Contract. If an Agency chooses to make such a payment as provided in 279C.515, the Contractor and the Contractor's surety shall not be relieved from liability for unpaid claims.

9.12.2. Contract completed. If the Contract has been completed and all funds disbursed to the prime Contractor, all claims shall be referred to the Contractor's surety for resolution. The Agency shall not make payments to subcontractors or suppliers for Work already paid for by the Agency.

1.10 ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

A. 10.1 SAFETY PRECAUTIONS AND PROGRAMS

1. Add the following sentence to Article 10.1

Where asbestos abatement is part of the Work, the Contractor or appropriate subcontractor shall be licensed by the Department of Environmental Quality to perform "asbestos abatement work", OAR 340-248-0120, Adopted January 25, 1990, and meet requirements of AHERA, as specified in Federal Register 40CFR, Part 763.

B. 10.3 HAZARDOUS MATERIALS

1. Delete Subparagraph 10.3.3.

1.11 ARTICLE 11 INSURANCE AND BONDS

A. 11.1 CONTRACTOR'S LIABILITY INSURANCE

1. Modify the second sentence of Subparagraph 11.1.2 as follows:

a. Delete the following: "....and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of coverage as specified in the Contract Documents."

2. Add the following Clause to Subparagraph 11.1.2:

.1. The Contractor shall provide and maintain in force for the duration of this agreement, the following:

.1 General Insurance:

The Contractor shall maintain in force for the duration of this agreement a Umbrella Insurance Policy with the limits not less than $5,000,000, a Commercial General Liability, Automobile Liability (owned, non-owned and hired) Insurance policy(s) written

on an occurrence basis with limits not less than $1,000,000 per occurrence and $2,000,000 in the aggregated naming the District, its employees, officials and agents as an additional insured as respects to work or services performed under this agreement. This insurance will be primary to any insurance the District may carry on its own. If the District requires Professional Liability coverage, the terms, conditions, and limits must be approved by the District's Risk Manager.

.2 Workers' Compensation:

Contractor shall provide and maintain workers' compensation coverage for its employees, officers, agents, or partners, as required by applicable workers' compensation laws.

.3 Evidence of Coverage:

Evidence of the above coverages issued by a company satisfactory to the District shall be provided to the District by way of a certificate of insurance before any work or services commence. A 30-day notice of cancellation or material change in coverage clause shall be included. It is the Contractor's obligation to provide the 30 days notice if not done so by the Contractor's insurance company(s). Failure to maintain the proper insurance shall be grounds for immediate termination of this Agreement.

.4 Subcontractors:

The Contractor shall require all subcontractors to provide and maintain general liability, auto liability, professional liability (as applicable) and Workers' Compensation insurance with coverage's equivalent to those required of the General Contractor in this Agreement. The Contractor shall require certificates of insurance from all subcontractors as evidence of coverage.

.5 Exceptions or Waivers:

Any exception or waiver of these requirements shall be subject to review and written approval from the Eugene School District Risk Manager.

3. Delete the third sentence of Subparagraph 11.1.3

B. 11.3 PROPERTY INSURANCE

1. Modify the first sentence of Subparagraph 11.3.1 as follows:
   a. Delete "Unless otherwise provided, the Owner" and substitute "The Contractor".
   b. Modify the last sentence by adding "Architect," after the word "Owner".
2. Add the following to Clause 11.3.1.1:

   The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributed thereto.
3. Delete Clause 11.3.1.2.
4. Modify Clause 11.3.1.3 by substituting "Contractor" for "Owner".
5. Delete Clause 11.3.1.4.
6. Modify the first sentence of Subparagraph 11.3.2 to read: "The Owner, at the Owner's option, may purchase...".
7. Delete Subparagraph 11.3.4.
8. Delete Subparagraph 11.3.6, and substitute the following:

   11.3.6 Evidence of the above coverages issued by a company satisfactory to the District shall be provided to the District by way of a certificate of insurance before any work or services commence. A 30-day notice of cancellation or material change in coverage clause shall be included. It is the Contractor's obligation to provide the 30 days notice if not done so by the

Contractor's insurance company(s). Failure to maintain the proper insurance shall be grounds for immediate termination of this Agreement.

9. Modify 11.3.7 by substituting "Contractor" for "Owner" at the end of the first sentence.

10. Modify the first sentence of Subparagraph 11.3.8 to read as follows:

    11.3.8 A loss insured under the Contractor's property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor and Owner, as their interests may appear, subject to requirements of any applicable mortgagee clause.

11. Delete Subparagraph 11.3.9.

12. Modify the first sentence of Subparagraph 11.3.10 by substituting "Contractor" for "Owner" the first two times it occurs. Modify the last sentence by substituting "Contractor" for "Owner" the second time it occurs.

13. Add the following Subparagraph:

    11.3.11 EQUIPMENT AND MATERIAL:

    The Contractor shall be responsible for any loss, damage, or destruction of Contractor's own property, equipment, and materials used in conjunction with the Work.

C. 11.4 PERFORMANCE BOND AND PAYMENT BOND

1. Delete 11.4.1 and substitute the following:

    11.4.1 Unless otherwise stated in the solicitation document, prior to execution of the Agreement, the Bidder shall furnish separate bonds that in all respects conform to the requirements of ORS 279C.380 covering the faithful performance of the Contract, and the payment of all obligations arising thereunder, each in an amount equal to one hundred percent (100%) of the Contract sum. The duration of the performance bond shall match the length of the project warranty.

    11.4.2 The surety issuing such bonds shall be duly authorized and licensed to issue bonds in the State of Oregon. The bonds shall be executed by an Attorney-in-fact, principal or other authorized representative for the surety company, showing the Oregon agent for service, and bears the seal of the surety company. Where the bond is executed by a person outside the state of Oregon, his authority to execute bond shall be shown.

    11.4.3 Bonds are to be obtained through a company that is on the US Government Treasury list for approved sureties and/or approved by the Owner's Risk Manager.

    11.4.4 Bonds shall be submitted on AIA Document A312, latest edition.

    11.4.5 The cost of furnishing such bonds shall be included in the bid.

    11.4.6 The Contractor shall deliver the required bonds to the Owner with the signed Agreement to:

    Don Philpot, Project Manager
    Facilities Management Office
    Eugene Public School District 4J
    715 West Fourth
    Eugene, Oregon 97402

    11.4.7 The Contractor shall require the Attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of their power of attorney.

D. Add the following Paragraphs to Article 11:

1. 11.5 PUBLIC WORKS BOND:

    11.5.1 Pursuant to ORS 279C.836, for any contract awarded where the contract price is $100,000 or greater, the Contractor and every subcontractor shall have a Public Works bond, in the amount of $30,000 filed with the Construction Contractors Board (CCB) before starting

work on the project unless exempt. This bond is in addition to performance bond and payment bond requirements. **A copy of the Contractor's BOLI Public Works Bond shall be provided with the executed contract documents.**

11.5.2 Contractor shall include in every subcontract a provision requiring their Subcontractors to have a public works bond filed with the CCB before starting work on the project, unless exempt. Contractors shall verify that all of their subcontractors have filed a public works bond with the CCB.

1.12 ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

A. 12.2 AFTER SUBSTANTIAL COMPLETION

1. Add the following sentence to Clause 12.2.2.1:

The correction period relating to faulty products and workmanship will begin on the date appearing on the Certificate of Substantial Completion, or if a Certificate of Substantial Completion is not issued, on the date appearing on the Final Certificate of Payment to the Contractor, whichever is earlier. The Owner's use of the project will not alter the warranty period herein defined.

2. Add the following sentence to Clause 12.2.2.2:

The correction periods specified are an extension of the one-year correction period called for in the General Conditions and are in addition to any guaranty bond called for elsewhere.

1.13 ARTICLE 13 MISCELLANEOUS PROVISIONS

A. 13.1 GOVERNING LAW

1. Change Paragraph 13.1 to read as follows:

13.1 The Contract shall be governed by the law of the place where the Project is located.

B. Add the following Subparagraph 13.1.1:

13.1.1 Contractor shall be in compliance with the Oregon Department of Revenue tax certification rules including OAR 150-305.385 (6)-A, (6)-B, (6)-C and (7).

C. Revise Subparagraph 13.2.1 as follows:

Delete last two sentences, and replace with:

Contractor shall not assign, sell, dispose of, or transfer rights, nor delegate duties under the contract, either in whole or in part, without the Contracting Agency's prior written consent. Unless otherwise agreed by the Contracting Agency in writing, such consent shall not relieve the Contractor of any obligations under the contract. Any assignee or transferee shall be considered the agent of the Contractor and be bound to abide by all provisions of the contract. If the Contracting Agency consents in writing to an assignment, sale, disposal or transfer of the Contractor's rights or delegation of Contractor's duties, the Contractor and its surety, if any, shall remain liable to the Contracting Agency for complete performance of the contract as if no such assignment, sale, disposal, transfer or delegation had occurred unless the Contracting Agency otherwise agrees in writing, in accordance with ORS 279A.065.

D. Delete Subparagraph 13.2.2

E. Add the following Paragraphs to Article 13:

1. 13.8 ENVIRONMENTAL AND NATURAL RESOURCES LAWS AND RULES

13.8.1 The Contractor and subcontractors shall comply with federal, state, and local ordinances and regulations dealing with prevention of pollution and preservation of natural resources that affect Work of this project.

13.8.2 Pursuant to ORS 279C.525, If the Contractor is delayed or must undertake additional work by reason of existing regulation or ordinances of agencies not cited in the Contract

Documents or due to the enactment of new or the amendment of existing statutes, ordinances, or regulations relating to the prevention of environmental pollution and the preservation of natural resources occurring after the Bid Date, the Owner will grant a time extension and issue a change order setting forth the additional work that must be undertaken. The change order shall not invalidate the contract and there shall be, in addition to a reasonable extension of the Contract time, a reasonable adjustment in the Contract price to compensate the successful bidder for all costs and expenses incurred, including overhead and profits, as a result of such delay or additional work.

2. 13.9 FOREIGN CONTRACTORS

In the event this Contract is awarded to a Contractor not domiciled in or registered to do business in the State of Oregon and the contract price exceeds $10,000, the Contractor shall promptly report to the Department of Revenue the total price, terms of payment, length of contract, and such other information as the Department of Revenue may require before final payment can be received on the public contract. The Owner will satisfy itself that the requirement of this subsection has been complied with before it issues a Final Payment.

3. 13.10 EQUAL OPPORTUNITY

13.10.1 The Contractor shall maintain policies of employment as follows:

13.10.1.1 The Contractor and the Contractor's subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin, physical or mental handicap, sexual orientation or age, unless based upon bona fide occupational qualifications; and that they are otherwise in compliance with all federal, state and local laws prohibiting discrimination. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. It is further understood that any vendor who is in violation of this clause shall be barred forthwith from receiving awards of any purchase order from the School District, unless a satisfactory showing is made that discriminatory practices have terminated and that a recurrence of such acts is unlikely. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

13.10.1.2 The Contractor and the Contractor's subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

4. 13.11 DRUG-TESTING PROGRAM

13.11.1 The contractor agrees with the provisions of Oregon Revised Statutes 279C.505, which requires that the contractor shall demonstrate it has established a drug-testing program for employees and will require each subcontractor providing labor for the Project to do the same.

1.14 ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

No modifications.

1.15 ARTICLE 15 CLAIMS AND DISPUTES

A. 15 CLAIMS AND DISPUTES

1. Add the following to Clause 15.1.5.2

Abnormal weather conditions for the purposes of this agreement are defined as conditions more extreme than any conditions experienced within the general vicinity of the site for each project for a comparable period at any time within the past ten years.

2. Delete Subparagraph 15.1.6.

B. 15.2 INITIAL DECISION

1. Modify Subparagraph 15.2.1 as follows:

In the third sentence, change "30 days" to read "10 days" and add the following: The Initial Decision Maker shall review all submitted claims and render decisions as soon as possible.

2. Modify Clause 15.2.6.1 as follows:

In the first sentence, change the "30 days and "60 days" to read "10 days" and "30 days" respectively.

C. 15.3 MEDIATION

1. Delete Paragraph 15.3 MEDIATION, and substitute the following:

15.3 MEDIATION AND ARBITRATION

15.3.1 Parties shall attempt to resolve all disputes at the lowest possible level. Both parties to this Agreement agree to provide other resources and personnel to negotiate and find resolution to disputes that cannot be resolved at the Project Manager level. As a next step, claims, disputes or other matters in question between the parties to this Agreement arising out of or relating to this Agreement or breach thereof shall be determined by mediation, arbitration or litigation. Disputes shall be initially submitted to mediation by a mediator chosen by the parties. The cost of mediation shall be borne equally by the parties. If the parties are unable to agree upon a mediator within five days or if mediation fails to resolve the dispute, either party may request that the dispute be submitted to arbitration before a single arbitrator agreed to by the parties in an additional five days. If both parties agree to arbitration but are unable to agree upon an arbitrator, each party shall select an arbitrator, the arbitrators so chosen shall select a third, and the decision of a majority of the arbitrators shall be final, binding the parties, and any judgment may be entered thereon. Unless the parties mutually agree otherwise, any arbitration proceeding shall be conducted in accordance with the currently in effect Construction Industry Arbitration Rules of the American Arbitration Association.

Notwithstanding the above, the Owner may, at the Owner's sole discretion, elect to resolve disputes in excess of $50,000 by litigation, if mediation is not successful.

15.3.2 In the event of arbitration or litigation arising out of the execution of this Agreement, the prevailing party shall be entitled to recover from the adverse party, reasonable attorney fees and costs for the arbitration proceedings, trial court or any appellate proceeding, in the amount determined by the arbitrator or the court, as appropriate.

For the purposes of the above provisions referring to attorney fees and related costs, the prevailing party in an arbitration proceeding or trial shall be a claimant who receives an award or damages in excess of the adverse party's pretrial or prehearing offer made at least 10 days before trial or hearing. If the claimant receives an award of damages no greater than the adverse party's pretrial or prehearing offer, the adverse party shall be deemed to be the prevailing party. In the event both sides are awarded damages, the prevailing party shall be the party who recovers the net award, provided the recovery exceeds the adverse party's pretrial or prehearing offer. If the claimant net recovery is no greater than the adverse party's pretrial or prehearing offer, the adverse party shall be deemed the prevailing party.

D. 15.4 ARBITRATION

1. Delete Paragraph 15.4 ARBITRATION.

END OF DOCUMENT 00 73 00

SECTION 00 73 43
PREVAILING WAGE RATES

PART 1 GENERAL

1.1 PREVAILING WAGE RATES

The Prevailing Wage Rates dated January 1, 2013, including any subsequent corrections or amendments issued by the Oregon Bureau of Labor and Industries, are included as a portion of the Contract Documents by reference. Copies are available for review at the office of Facilities Management, School District 4J, and can be viewed on line at www.boli.state.or.us. Click on Prevailing Wages, then PWR Rate Publications, and then Prevailing Wage Rates for Public Works Contracts in Oregon (subject only to state law).

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of reroofing, replacement of existing condensing unit, and at Churchill High School, reroofing and related demolition at Kelly Middle School, and replacement of roof expansion joint covers at Sheldon High School.

1. Project Locations:
   a. Churchill High School, 1850 Bailey Hill Road, Eugene, OR 97405.
   b. Kelly Middle School, 850 Howard Avenue, Eugene, OR 97404.
   c. Sheldon High School, 2455 Willakenzie Road, Eugene, OR 97401.
   d. Education Center, 200 North Monroe Street, Eugene, OR 97402.
2. Owner: Eugene School District 4J, 715 West Fourth Avenue, Eugene, OR 97402.

B. Architect Identification: The Contract Documents, dated April 17, 2014, were prepared for Project by Robertson/Sherwood/Architects pc, 132 East Broadway - Suite 540, Eugene, OR 97401.

C. Project Manager: Don Philpot, Project Manager has been appointed by Owner to serve as Project Coordinator.

1.3 CONTRACT

A. Project will be constructed under a general construction contract.

1. Multisite Roofing 2014 – C.I.P. No. 420.780.209.

1.4 WORK SEQUENCE

A. Do not commence Work until after execution of Agreement and receipt of Notice-to-Proceed from Owner, nor before June 18, 2014.

B. Perform work in order to achieve Substantial Completion by Monday, August 25, 2014.

C. Achieve Final Completion within seven (7) calendars days following the date of Substantial Completion.

D. Do not perform any onsite work at Kelly Middle School on August 22, 2014.

1.5 USE OF PREMISES

A. Work Area Access: Buildings will be occupied during work. Access to the work area will be available on a week-day basis from approximately 7:00 am to 4:00 pm. Coordinate all other work hour schedules with Owner so as not to interfere with Owner's use of the building.

B. Limit use of the premises to construction activities adjacent to areas of work. Allow for Owner occupancy and use by the public, subject to approval by a District Safety Specialist.

C. Site Access: Maintain drives and building entrances and exits clear and protected at all times to Owner's, employees, and public access and for use by emergency personnel. Do not use these areas for parking or storage. Schedule deliveries to minimize space and time requirements for storage of materials at site.

D. Parking: Contractor may use existing parking areas.

E. Contractor Staging Areas: Limit staging to areas adjacent to Work or where indicated on Drawings.

F. Construction Operations: Limited to areas indicated on Drawings.

1.6 WORK UNDER SEPARATE CONTRACTS

A. Separate Contract: Owner will have awarded separate contracts for performance of certain construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract:
1. Churchill High School: Floor Tile Replacement, Fire and Life Safety Improvements.
2. Sheldon High School: Fire and Life Safety Improvements.
3. Education Center: Perimeter Drive Paving, Exterior Painting.

1.7 FUTURE WORK

A. None listed

1.8 PRODUCTS ORDERED IN ADVANCE

A. None listed

1.9 OWNER-FURNISHED PRODUCTS

A. Dryrot and Fungus Inhibitor: Clear preservative; spray and brush applied.

B. Split System Cooling Condensers and associated Curbs.

1.10 MISCELLANEOUS PROVISIONS

A. Drug and Alcohol Policy
1. The possession, use, or distribution of illicit drugs and alcohol on school premises is prohibited. Prescription medications brought to the project site shall be in the original container bearing the name of the drug, the name of the physician and the prescribed dosage.

B. Use of Tobacco Products
1. Smoking and the other use of tobacco products is prohibited on all school district property pursuant to OAR 581-021-0110.

C. Safety Requirements
1. Safety must not be sacrificed for the sake of productivity or expedience. Safety of students, staff, and the public is critical. Take all reasonable precautions to prevent endangerment or injury. Advise and coordinate operations with the school office.
2. All contractors who perform work on District property, and their employees, are expected to know the District's expectations for safe work and to adhere to those expectations.
3. Contractors are to adhere to the regulations of Oregon OSHA for all projects within the School District.

D. General Safe Work Practices
1. Students, public and school staff shall not be put at risk by the activities of contractors or their employees.
2. Safe vehicle operation rules are to be followed at all times. These include positioning vehicles to minimize the necessity of backing and providing a "spotter", someone who will make sure that people do not run into the path of a vehicle when driving on a playground or field that is occupied by students.
3. Tools shall never be left out when an unsecured work area is vacated.
4. Ladders and scaffolding will be taken down when an unsecured work area is vacated.
5. Open holes and other tripping hazards shall be fenced or barricaded when an unsecured work area is vacated.
6. Operations resulting in vapors, emissions or flying objects shall be conducted in such a way as to prevent exposure to any unprotected parties or property.
7. "Secured Work Area" is defined as an area having a perimeter cyclone fence at least 6 feet in height, with gates which close and lock so that no casual entrance is possible by unauthorized adults or children.
8. Contractor to follow all OR-OSHA rules for Confined Spaces, where applicable.

E. Communications Regarding Unsafe Practices
1. Upon perceiving a problem, the District will immediately communicate the concern to the Contractor or Contractor's representative on the work site.
2. If agreement on correction of unsafe conditions cannot be reached, the concerns of the District shall prevail and safety concerns shall be addressed in accordance with the District requirements.

F. Electrical Panels - Lockout/Tagout
1. Contractor shall implement a Lockout/Tag-out program for his employees who take equipment out of service or place equipment back into service. Contractor shall review the District's Energy Control Program prior to commencing work. Rules applying to this procedure are Oregon Occupational Safety and Health Code OAR 437, Division 2, Subdivision J, General Environmental Controls Lockout/Tag-out (1919.147), or latest edition.

G. Arc Flash – Electrical Safety
1. Comply with NFPA 70E (Electrical Safety in the Workplace), current edition. Contractor shall comply with Oregon OSHA 1910.137 (Personal Protective Equipment). Review with the School District Project Manager the 'Eugene School District Electrical Safety Program' before any work commences. Comply with all 'Arc Flash' and 'Electrical Safety' protocols referenced in any and all NFPA, OSHA, OROSHA, NEC, NESC, UL, IBC, IFC and ANSI documents (current editions).

H. Potentially Hazardous Products
1. The District attempts to maintain a safe and healthy environment for students and staff. The Contractor is therefore required to follow District guidelines controlling the use of potentially hazardous products and to use these products in a safe manner. Guidelines include the use of materials (adhesives, coatings, carpeting, etc.) which are known to emit little or no airborne pollutants.
2. MSDS information is required for all potentially hazardous products. The Project Manager and a District Safety Specialist will review these and determine what, if any, mitigation procedures will be required.
3. Contractor is to maintain and post copies of all MSDS information at the project site and adhere to the required controls.
4. Contractor is to ensure that work area by students and teachers is restricted. The District will provide signage appropriate for this purpose. The Contractor is to construct and maintain appropriate barriers. This shall include provision of physical separation barriers between “construction” and “occupied” spaces.

5. Contractor to adopt means of maintaining the construction space in negative air pressure in relation to occupied spaces.
6. Where there is a new or existing ventilation system in an affected space, the system shall be adjusted to provide the maximum amount of outside air possible with the system.
7. Efforts shall be made to install and operate new ventilation systems as soon in the construction process as practical.

I. Asbestos Containing Materials Warning
1. Asbestos containing materials are known to exist in areas of the Work. The Contractor shall not, in any way, disturb materials which are known to contain asbestos, assumed to contain asbestos, or otherwise have not been tested and confirmed to be asbestos free.
2. Where access to concealed spaces is required, or it is necessary to disturb building materials such as for drilling of holes, cutting, etc., notify the Owner so that proper investigation and/or removal procedures are followed.
3. Prior to commencing Work, the Contractor shall meet with the District Safety Specialist and review the Owner's Asbestos Management Plan for the locations of asbestos-containing materials and/or materials assumed to contain asbestos. After reviewing the Owner's Asbestos Management Plan, the Contractor is required to sign Form 01 10 00A, Asbestos-containing Materials Notification Statement, provided at the end of this Section.
4. Contractor must not install any asbestos-containing materials when performing the Work of this project. At the completion of the Work, Contractor will be required to furnish a statement stating that no asbestos-containing materials were installed during the course of the Work. Refer to Sample Form 01 10 00B at the end of this Section

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Form 01 11 00 A

ASBESTOS-CONTAINING MATERIALS NOTIFICATION STATEMENT FOR CONTRACTORS

This form must be completed and signed by the Contractor prior to beginning work in any Eugene School District 4J building.

The presence of known and assumed asbestos containing materials is documented in the AHERA Management Plan for each building. Copies of the AHERA Management Plan are available in the main office of each building and in the Facilities Management Office at 715 West Fourth Avenue, Eugene, Oregon. The District Asbestos Specialist must be informed of the Contractor's activities in each building prior to the start of work so that the Contractor can be informed on how to use the AHERA Management Plan and to determine if any asbestos-containing materials are likely to be impacted by the work of the Contractor.

The Contractor is responsible for notifying all employees and subcontractors of the presence of asbestos in the building. The Contractor shall not disturb known or assumed asbestos-containing materials. If the Contractor discovers suspected asbestos-containing materials that have not been identified, the Contractor must stop any work impacting the suspected materials and notify the District Asbestos Specialist so that the material can be sampled. Any asbestos-containing materials that must be removed to allow the Contractor to complete the Contractor's work will be removed by the District under separate contract. If the Contractor disturbs asbestos-containing materials, the Contractor will be responsible for the cost of the cleanup and decontamination..

I _____, Representing _____,
(Print Name of Representative) (Business Name)

have been notified of the location of the AHERA Management Plan and agree to avoid impacting all known or assumed asbestos-containing materials in the performance of the Work.

_____ _____
Signature of Representative Date

_____ _____
Work Site CIP #

Form 01 11 00 B

The Environmental Protection Agency (AHERA) rules require the School District obtain a signed statement from the Site Superintendent that, to the best of his/her knowledge, no asbestos-containing building materials were installed during the Work. Therefore, the following statement must be submitted on the Contractors letterhead prior to Project Closeout.

SAMPLE FORM
(To be submitted on the Contractor's letterhead)

ASBESTOS-CONTAINING MATERIALS STATEMENT

EUGENE SCHOOL DISTRICT 4J

_____
(Name of Project and CIP Number)

We the undersigned, (Name of Company), hereby warrant that to the best of our knowledge all materials furnished for the above referenced project contain 0% asbestos.

_____
(Name of Construction Company)

_____
(Signature and Date)

_____
Printed Name

_____
Job Title

END OF SECTION

SECTION 01 25 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:

1. "Agreement" for monetary values of established Unit Prices and Alternates.
2. "General Conditions "for additional requirements for Changes in the Work, Contract Sum, and Contract Time.
3. Section 00 11 13 - Supplementary Conditions: Allowable percentages for Contractors' Overhead and Profit.
4. Section 01 33 00 - Submittal Procedures: Schedule of Values requirements.
5. Section 01 60 00 - Product Requirements: Administrative procedures for handling requests for substitutions made after Contract award.
6. Division 01 Section 01 78 39 "Project Record Documents" documentation requirements.

1.3 MINOR CHANGES IN THE WORK

A. Architect, with the concurrence of the Owner, will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 CHANGE REQUEST/PROCEED ORDER (CONSTRUCTION CHANGE DIRECTIVE)

A. Architect or Owner may issue a Change Request/Proceed Order on form included at end of Part 3.

1. Change Request contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
2. Proceed Order, when signed by the Owner, instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Proceed Order.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

C. Authorization Required: When a Change Request is approved and signed by the Owner, it becomes a Proceed Order authorizing the change requested. Do not proceed with any change without the Owner's signature on the Change Request/Proceed Order.

D. Owner-Initiated Change Requests: Architect will issue a Change Request, which will include a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Change Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Change Request after receipt of Change Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a complete cost breakdown including a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor, supervision, overhead, and profit directly attributable to the change.
    d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

E. Contractor-Initiated Requests: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect.

1. Changes requested by the Contractor will be authorized only by signature of the Owner on the prescribed. Do not proceed with any changes without this authorization.
2. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
5. Include costs of labor, supervision, overhead, and profit directly attributable to the change.
6. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
7. Comply with requirements in Division 1 Section 01 60 00 "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

F. Change Request Form: Use forms provided by Owner. Sample copies are included at end of Section 3.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Change Request, and at intervals to be determined, Architect will collect Change Requests and issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

CHANGE REQUEST/PROCEED ORDER
1992-2017 Capital Improvement Program
Eugene School District 4J

CHANGE REQUEST NOTICE No. _____ Date: _____

Project No.:_____ Contract No.:_____ Date: _____
Project Title: _____
Contractor: _____

1. **REQUEST INFORMATION**
   Estimated $_____ Time_____ Days_____ Initiated by _____
   Reason for change:
   _____

2. **DESCRIPTION**
   Describe changes: _____
   _____
   Describe affected work: _____
   List plan and spec sections: _____
   Describe impacted activities: _____
   Comment: _____

3. **DATES**
   Need for change first known _____ By whom _____
   Contractor first notified _____ How _____
   Owner first notified _____
   Date approved or rejected _____ By whom _____

4. **RECOMMENDATION (cost and time)** _____

PROCEED ORDER No.: _____ Date: _____

1. **PAYMENT/COST**
   Actual amount of change $_____ The contract time will be:
   Contractor amount $_____ ( ) increased ( ) decreased by ___days
   Subcontractor amount $_____ ( ) will remain unchanged
   Type of payment (LS/T&M) _____

2. **MISCELLANEOUS**
   Subcontractors involved: _____
   Major materials:_____
   The cost is not to exceed $_____ Date: _____

3 **CHANGE REQUEST ACCEPTED BY:**
   Contractor: _____ Date: _____
   Architect: _____ Date: _____
   4J CIP Project Manager: _____ Date: _____
   4J CIP Program Manager: _____ Date: _____
   4J Facilities Director: _____ Date: _____

Without the signature of Facilities Director, or the acting Director, this Proceed Order is neither accepted or authorized, except by written authorization of other specific delegation.

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Section 01 25 00 - Contract Modification Procedures: Administrative procedures for handling changes to the Contract.
2. Section 01 32 00 - Construction Progress Documentation: Administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
3. Section 01 77 00 - Closeout Procedures: Requirements for Final Completion.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.
c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect and Owner at earliest possible date but no later than seven days before the date scheduled for submittal of initial Application for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders issued before last day of construction period covered by application.
3. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours.

D. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values (draft submitted previously).

3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (based Architect's list or required submittals).
7. List of Contractor's staff assignments.
8. Initial progress report.
9. Report of preconstruction conference.

E. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

F. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements (See itemized list in Section 01 77 00 "Closeout Procedures").
2. Updated final statement, accounting for final changes to the Contract Sum.
3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
5. AIA Document G707, "Consent of Surety to Final Payment."
6. Evidence that claims have been settled.
7. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Administrative and supervisory personnel.
   2. Project meetings.

B. Related Sections include the following:
   1. Section 01 32 00 - Construction Progress Documentation: Contractor's Construction Schedule.
   2. Section 01 73 00 - Execution Requirements: Procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Section 01 77 00 - Closeout Procedures: Coordinating Contract closeout.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.
   4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

   1. Preparation of Contractor's Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

A. Key Personnel Names: Within 15 days of Notice-to-Proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including pager, cell, and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Schedule meeting dates and times with Owner and Architect.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Architect will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, within three days of receiving them from the Architect.

B. Preconstruction Conference: Owner's Project Manager will schedule a preconstruction conference before starting construction, no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Owner's Project Manager, Architect, and their consultants, as required; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following (see sample agenda at the end of Part 3):

    a. Introduction of persons present.
    b. Tentative construction schedule.
    c. Phasing.
    d. Critical work sequencing and long-lead items.
    e. Designation of key personnel and their duties.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for requests for interpretations (RFIs).
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Communications.

l. Role of District's Project Manager.
m. Submittal procedures, including MSDS information.
n. Energy design requirements.
o. Preparation of Record Documents.
p. Use of the premises and existing building.
q. Work hours and restrictions.
r. Owner's occupancy requirements.
s. Responsibility for temporary facilities and controls.
t. Construction waste management and recycling.
u. Parking availability.
v. Office, work, and storage areas.
w. Equipment deliveries and priorities.
x. Safety and first aid.
y. Security.
z. Progress cleaning.

3. Minutes: Architect will record and distribute meeting minutes.
4. Statements made by the Contracting Agency's representative at the pre-construction conference are not binding upon the Contracting Agency unless confirmed by Written Addendum.

C. Preinstallation Conferences: When required by individual specification sections, conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner's Project Manager a minimum of four days prior to scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract documents.
b. Related requests for interpretations (RFIs).
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Submittals.
g. Possible conflicts.
h. Compatibility problems.
i. Time schedules.
j. Weather limitations.
k. Manufacturer's written recommendations.
l. Warranty requirements.
m. Compatibility of materials.
n. Acceptability of substrates.
o. Space and access limitations.
p. Regulations of authorities having jurisdiction.
q. Testing and inspecting requirements.
r. Installation procedures.
s. Coordination with other work.
t. Required performance results.
u. Protection of adjacent work.

3. Contractor to record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Distribute minutes of the meeting to each party present and to parties who should have been present, within three working days.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to the Owner's Project Manager and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Requests for interpretations (RFIs).
16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

3. Minutes: Architect will record and distribute to Contractor the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PRECONSTRUCTION CONFERENCE AGENDA (SAMPLE)
EUGENE SCHOOL DISTRICT 4J
MULTISITE ROOFING AND SEISMIC 2013

1. ( ) Introduction of Persons Present
   - ( ) District 4J
   - ( ) Consultants
   - ( ) Contractor (including job foreman)
   - ( ) Subcontractors

2. ( ) Availability of Contract Documents

3. ( ) Building Permit Status
   - ( ) Plan check and Building Permit paid by District
   - ( ) Pick up Permit at City of Eugene by Contractor
   - ( ) Location of site stored approved contract documents
   - ( ) Utility permits
   - ( ) LRAPA Permit

4. ( ) Prevailing Wage Requirements
   - ( ) Submittal schedule
   - ( ) Conformance with requirements

5. ( ) Communications
   - ( ) Notification of problems

6. ( ) Role of District's representative
   - ( ) Limits of authority
   - ( ) Visitation schedules

7. ( ) Work Description and Schedule
   - ( ) General work description
   - ( ) Proposed start date: _____
   - ( ) Proposed completion date: _____
   - ( ) Proposed project schedule and phasing
   - ( ) Progress schedule updates
   - ( ) Methods to be employed to maintain schedule
   - ( ) Work requiring Shop Drawings or submittals shall not commence until review is complete.

8. ( ) Submittals Required per Contract Documents
   - ( ) MSDS Information
   - ( ) Written proof of Asbestos Worker Certification
   - ( ) Name, Experience and Qualifications of Asbestos Supervisor
   - ( ) Copy of Contractor's Asbestos Abatement License
   - ( ) Other information as required by Section 01 31 00.
   - ( ) Schedule of values
   - ( ) List of subcontractors including name of contact person, telephone number, and address

9. ( ) Construction
   - ( ) Working hours
   - ( ) Use of premises/set up locations
   - ( ) Protection of existing facilities
   - ( ) Traffic and protection
   - ( ) Excavation and clean-up
   - ( ) Weather restrictions
   - ( ) Deviation from details and/or specifications

10. ( ) Correction of Defects
    ( ) Daily and/or as observed

11. ( ) Weekly On-Site Progress Meetings
    ( ) Establish day and time: Day _____Time _____
    ( ) Provide updated project schedules
    ( ) Discuss project progress, problems, etc.
    ( ) Review applications for payment
    ( ) Required attendance
    ( ) Observation report distribution

12. ( ) Change Order Requests and Change Order Procedures
    ( ) Written Change Order requests required
    ( ) Supporting back-up will be required for all Change Orders
    ( ) Mark-up limitations on Change Orders
        ( ) Contractor - 15 percent
        ( ) Subcontractors - 10 percent
    ( ) Progressive requests and Change Orders
    ( ) Processing time required

13. ( ) Applications for Payment
    ( ) Use AIA documents G702 and G703 latest edition
    ( ) Provide 5 signed and notarized copies
    ( ) Wage certifications to be attached

14. ( ) Safety and Emergency Procedures

15. ( ) Clean-up Daily
    ( ) Project completion

16. ( ) Project Closeout
    ( ) Inspections for
        ( ) Air Clearance
        ( ) AHERA Close Out Requirements
        ( ) Substantial completion
            ( ) Contractor provided list of items to be completed
            ( ) Inspection with job foreman
        ( ) Final Acceptance
            ( ) Written notice from Contractor that all work is done and ready for inspection
            ( ) Inspection with job foreman
        ( ) Responsibility for cost of additional inspections
        ( ) Submittals for Closeout
            ( ) Final application for payment
            ( ) Final set of wage certifications
            ( ) Release of liens from all Subcontractors and general Contractor

17. ( ) Tour of Project Sites to Examine and Document Existing Conditions

18. ( ) Additional Comments

The undersigned acknowledges that the items listed above were discussed during this preconstruction conference and are fully understood.
A/E Firm:

Contractor:

Subcontractors:

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Preliminary Construction Schedule.
   2. Contractor's Construction Schedule.
   3. Submittals Schedule.

B. Related Sections include the following:
   1. Section 01 29 00 - Payment Procedures: Schedule of Values.
   2. Section 01 31 00 - Project Management and Coordination: Meeting and conference minutes.
   3. Section 01 33 00 - Submittal Procedures: Schedules and reports.
   4. Section 01 40 00 - Quality Requirements: Schedule of tests and inspections.

1.3 SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format.
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. Scheduled date for Architect's final release or approval.

B. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
   1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
   2. Initial Submittal: List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
   3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

B. Activities: Treat each floor or separate area as a separately numbered activity for each principal element of the Work

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

D. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section 01 11 00 "Summary of Work." Delivery dates indicated stipulate the earliest possible delivery date.

E. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section 01 11 00 "Summary of Work." Delivery dates indicated stipulate the earliest possible delivery date.

F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

G. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE [SMALL PROJECTS]

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 10 days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner's Project Manager, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, Information Submittals, Delegated Design and other submittals.

B. Related Sections include the following:

1. Section 01 29 00 - Payment Procedures: Applications for Payment and the Schedule of Values.
2. Section 01 31 00 - Project Management and Coordination: Meeting and conference minutes and Coordination Drawings.
3. Section 01 32 00 - Construction Progress Documentation: Schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Section 01 40 00 - Quality Requirements: Test and inspection reports and for mockup requirements, if any.
5. Section 01 77 00 - Closeout Procedures: Warranties.
6. Section 01 78 23 - Operation and Maintenance Data: Operation and maintenance manuals.
7. Section 01 78 39 - Project Record Documents: Record Drawings, Record Specifications, and Record Product Data.
8. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

B. Submittals Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation, for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough 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 calendar 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.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, if received from sources other than Contractor without prior consent.

1. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Submittal and transmittal distribution record.
k. Remarks.
l. Signature of transmitter.

G. 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 "Approved" or “Approved as Corrected”.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Use only final submittals with mark indicating "Approved” or “Approved as Corrected” by Architect.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Standard color charts.
    e. Manufacturer's catalog cuts.
    f. Wiring diagrams showing factory-installed wiring.
    g. Printed performance curves.
    h. Operational range diagrams.
    i. Compliance with specified referenced standards.
    j. Testing by recognized testing agency.
    k. Application of testing agency labels and seals.
    l. Notation of coordination requirements.
    m. MSDS information, where applicable.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit the number required by the Contractor plus four (4) copies of Product Data, unless otherwise indicated. Architect will return two copies to Contractor and one to Owner. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    d. Schedules.
    e. Design calculations.
    f. Compliance with specified standards.
    g. Notation of coordination requirements.
    h. Notation of dimensions established by field measurement.
    i. Relationship to adjoining construction clearly indicated.
    j. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Number of Copies: Submit four opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit five copies where copies are required for operation and maintenance manuals. Architect will retain three copies, including one for the Owner's Project Manager; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
    a. Single scanned copy of each submittal, except for samples, and related transmittal may be sent by email in lieu of transmitting physical copies.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
    c. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies:

    a. Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
    b. Submit one copy of each submittal if sent be email.

2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Section 01 40 00 - Quality Requirements.

B. Coordination Drawings: Comply with requirements specified in Section 01 31 00 - Project Management and Coordination.

C. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 - Construction Progress Documentation.

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare 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.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. Material Test Reports: Prepare 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.

K. Product Test Reports: Prepare written reports indicating 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.

L. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 40 00 - Quality Requirements.

M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Section 01 78 23 - Operation and Maintenance Data.

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

T. Material Safety Data Sheets (MSDS): Submit information directly to Owner; do not submit to Architect.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. “Approved”, “Approved as Corrected”, or “Resubmit”.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:
   1. Section 01 32 00 - Construction Progress Documentation: Schedule of required tests and inspections.
   2. Divisions 2 through 49 Sections for specific test and inspection requirements.

1.3 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.

4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made by Owner.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section 01 33 00 "Submittal Procedures."

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.6 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, described below:
1. Epoxy anchors.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections.

B. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections include the following:

1. Section 01 11 00 - Summary of Work: Limitations on utility interruptions and other work restrictions.
2. Section 01 33 00 - Submittal Procedures: Implementation and termination schedule and utility reports.
3. Section 01 73 00 - Execution Requirements: Cleaning requirements.
4. Divisions 02 through 49 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

1.5 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.6 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.

1.7 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.

2.2 TEMPORARY FACILITIES - CONTRACTOR OPTION

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Storage: Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate 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 UTILITY INSTALLATION

A. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

C. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

D. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

E. Telephone Service: Provide superintendent with cellular telephone or portable two-way radio for use.

3.3 SUPPORT FACILITIES INSTALLATION

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

B. Parking: Arrange for temporary parking areas for construction personnel.

C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Section 01 73 00 - Execution Requirements, for progress cleaning requirements.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 01 11 00 - Summary of Work.

B. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

C. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.

1. Construct with framing sufficient to support 6 mil clear plastic sheeting.
2. Provide walk-off mats to minimize the tracking of dust and dirt at each entrance through temporary partition.

D. 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 in 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.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 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.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. 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.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. Related Sections include the following:
   1. Section 01 77 00 - Closeout Procedures: Warranties for Contract closeout.
   2. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Substitution Requests: Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period, in compliance with this Section.

B. After execution of Agreement, the Owner may, at the Owner's option, consider formal requests from the Contractor for substitution of products for those specified. One or more of the following conditions must be documented:
   1. Compliance with final interpretation of code requirements or insurance regulations which require that the use of a substituted Product.
   2. Unavailability of a specified Product through no fault of the Contractor.
   3. Inability of specified Product to perform properly of fit in designated place.
   4. Manufacturer's or Fabricator's refusal or inability to certify or guarantee performance of a specified Product in the application intended.

C. A Substitution Request constitutes a representation that the Bidder/Contractor:
   1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
   2. Will provide the same warranty for the Substituted Product as for the specified Product.

3. Will coordinate installation and make changes to the Work which may be required for the Work to be completed with no additional cost to the Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse the Owner for review or redesign services associated with re-approval by authorities.

D. Substitutions will not be considered when they are indicated or implied on Shop Drawings or Product Data Submittals, without separate request on the form provided, or when acceptance will require revision to the Contract Documents.

E. Submit three copies of each request for consideration. Limit each request to one proposed Substitution. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form provided at end of this Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
   a. Statement indicating why specified material or product cannot be provided.
   b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
   c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
   e. Provide MSDS information to confirm that the product is no more harmful that the products specified.
   f. Samples, where applicable or requested.
   g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
   h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
   i. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
   j. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
   k. Cost information, including a proposal of change, if any, in the Contract Sum.
   l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
   m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Acceptance: Change Order.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
9. Provide bonded and insured off-site storage and protection when site does not permit on-site storage and protection.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Submittal Time: Comply with requirements in Section 01 77 00 - Closeout Procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SUBSTITUTION REQUEST FORM

TO: Robertson/Sherwood/Architects pc
132 East Broadway - Suite 540
Eugene, Oregon 97401:

Deadline for requests: May 6, 2014

PROJECT: Multisite Roofing 2014
CIP # 420.780.209
Eugene School District 4J

SPECIFIED ITEM: _____ _____ _____
Section No. Paragraph Description

The Undersigned requests consideration of the following substitution:

_____

The Undersigned states that the following paragraphs are true, except where noted otherwise:

1. The function, appearance and quality of the proposed substitution are equivalent or superior to the specified item;
2. The proposed substitution does not affect dimensions shown on the Drawings;
3. The Undersigned will pay for changes to the building design, including engineering and design services, detailing and construction costs caused by the requested substitution;
4. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements;
5. Maintenance and service parts will be locally available for the proposed substitution;
6. The Undersigned has attached data concerning the proposed substitution, including: Manufacturers product description, specifications, drawings, photographs, performance and test data, adequate for evaluation of the request, with applicable portions of the data clearly indicated. Attachments also include description of changes to Contract Documents which the proposed substitution will require for its proper installation.

Submitted by: _____ Signature: _____ Firm: _____ Address: _____ _____ Date: _____ Tel: _____ Fax: _____ Attachments: _____	For use by Architect: ☐ Approved ☐ Approved as noted. ☐ Not Approved ☐ Received too late By: _____ Date: _____ _____ For use by 4J Project Manager: ☐ Approved ☐ Approved as noted. ☐ Not Approved ☐ Received too late By: _____ Date: _____

END OF SECTION

SECTION 01 73 00
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. General installation of products.
   3. Progress cleaning.
   4. Starting and adjusting.
   5. Protection of installed construction.
   6. Correction of the Work.

B. Related Sections include the following:
   1. Section 01 31 00 - Project Management and Coordination: Procedures for coordinating field engineering with other construction activities.
   2. Section 01 77 00 - Closeout Procedures: Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
   1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. PROCEEDING WITH THE WORK INDICATES ACCEPTANCE OF SURFACES AND CONDITIONS.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
   4. Maintain minimum headroom clearance of seven feet in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated. Bring any conflicts to the Architect for review.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints where possible. Obtain Architect and Owner's Project Manager approval for all questionable conditions.

H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to applicable regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for safety and proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.6 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Section 02 41 00 - Demolition: Demolition of selected portions of the building.
2. Divisions 2 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a written request describing procedures prior to the time cutting and patching will be performed, requesting approval to proceed, for cutting or alteration which affects:
1. Structural integrity of any element of Project.
2. Integrity of weather-exposed or moisture-resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of site-exposed elements.
5. Work of Owner or separate contractor.

B. Include the following information:
1. Identification of Project and CIP number
2. Location and description of the affected Work.
3. Necessity for cutting or alteration.
4. Description of proposed Work and Products to be used.
5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate contractor.
7. Written permission of affected separate contractor, if any.
8. Date and time work will be executed.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

2. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, which results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

B. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Section 01 29 00 - Payment Procedures: Requirements for Applications for Payment for Substantial and Final Completion.
2. Section 01 73 00 - Execution Requirements: Progress cleaning of Project site.
3. Section 01 78 39 - Project Record Documents: Record Drawings, Record Specifications, and Record Product Data.
4. Section 01 78 23 - Operation and Maintenance Data: Operation and maintenance manual requirements.
5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect and Owner's Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Section 01 29 00.
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit the following completed forms, items and documents:
    a. AIA Document G706 Contractor's Affidavit of Payment of Debts and Claims.
    b. AIA Document G706A Contractor's Affidavit of Release of Liens.
    c. AIA Document G707 Consent of Surety Company to Final Payment.
    d. Operation and Maintenance Manuals
    e. Warranties and Bonds. Submit original documents, including Contractor's General Warranty,
    f. Record Documents.
    g. Keys.
    h. Testing and Start-Up records.
    i. Affidavit of Prevailing Wages paid.
    j. Complete list of Contractor and all Subcontractors with address, phone numbers, and work
    k. Asbestos-Containing Materials Statement (Form 01100B).
    l. Proof of final acceptance and compliance from governing authorities having jurisdiction.
    m. Certificate of insurance evidencing continuation of liability coverage including coverage for completed operations until the expiration of the specified warranty periods.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect and Owner's Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Cost of additional re-inspections by Architect and Owner's Project manager will be deducted from Final Payment to the Contractor.

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 10 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Maintenance manuals for the care and maintenance of products, material, finishes, systems, and equipment.

B. Related Sections include the following:

1. Section 01 33 00 - Submittal Procedures: Submittals for operation and maintenance manuals.
2. Section 01 77 00 - Closeout Procedures: Operation and maintenance manuals.
3. Section 01 78 39 - Project Record Documents: Preparing Record Drawings for operation and maintenance manuals.
4. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 SUBMITTALS

A. Initial Submittal: Submit 2 draft copies of each manual at least 15 working days before requesting inspection for Final Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.4 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.

2. List of all subcontractors and material suppliers, including names, addresses and phone numbers.
3. Table of contents.

B. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include a Table of Contents for each volume with a list of products and major components of equipment included in the section on the face of each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software media for computerized electronic equipment.

4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

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

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

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

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

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

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each

product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

D. Comply with Section 01 77 00 - Closeout Procedures, for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:

1. Section 01 77 00 - Closeout Procedures: General closeout procedures.
2. Section 01 78 23 - Operation and Maintenance Data: Operation and maintenance manual requirements.
3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:
   a. Final Submittal: Submit one set of marked-up Record Prints (not "Job Shack" set).

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

1. Submit as a tabbed section in the Operation and Maintenance Manual.

C. Record Product Data: Submit one copy of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

2. Submit as a tabbed section in the Operation and Maintenance Manual.

D. Submit completed documents to Architect for review and approval prior to submittal of final Application for Payment.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

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 prepare the marked-up Record Prints.
   a. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

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. Changes made by Change Order.
   d. Changes made following Architect's written orders.
   e. Details not on the original Contract Drawings.
   f. Field records for variable and concealed conditions.
   g. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Note Alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets. Include the following information on the drawings cover page:
2. Identification: As follows:

   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Architect and Owner's Project Manager.
   e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to 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.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3. Note related Change Orders where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference. Include as a tabbed section in the Operation and Maintenance Manual.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Owner's Project Manager's reference during normal working hours.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alterations purposes.

B. Removal and replacement of miscellaneous items and devices to facilitate Work.

C. Salvage of specific items to Owner.

D. Other demolition as required to complete the Work.

1.2 RELATED REQUIREMENTS

A. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

B. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

C. Section 07 51 00 - Built-up Bituminous Roofing: Preparation of existing substrate.

D. Section 07 54 00 - Thermoplastic Membrane Roofing: Preparation of existing substrate.

E. Section 23 05 00 – Basic HVAC Requirements: Removal and replacement of roof mounted equipment.

F. Section 23 23 00 - Refrigerant Systems: Removal and recovery of refrigerant.

G. Section 26 05 00 - Basic Electrical Requirements: Removal and replacement of roof mounted equipment.

1.3 REGULATORY REQUIREMENTS

A. Conform to applicable codes and regulations for demolition work and dust control.

B. Obtain required permits from authorities. Comply with DEQ, OSHA, City of Eugene, Lane County, LRAPA and APD regulations governing demolition and disposal of asbestos-containing materials and other items encountered during the work.

C. Comply with required procedures applicable when hazardous or contaminated materials are discovered.

1.4 EXISTING CONDITIONS

A. Existing built-up roof assemblies have been sampled by the School District and have been tested for asbestos containment. Reports are available upon request at School District Facilities Office. All roofs tested negative with exception of:
   1. Churchill High School:
      a. Vapor barrier on concrete roof deck is positive for asbestos (Chrysotile 75%.)
      b. Detailing mastic is positive for asbestos (Chrysotile 3%.)
   2. Sheldon High School:
      a. Detailing mastic in areas roofed in 2000 is positive for asbestos (Chrysotile 2%.)

1.5 PROJECT CONDITIONS

A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 SCOPE

A. Remove existing construction as indicated on Drawings.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Provide, erect, and maintain temporary barriers and security devices.
   2. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   3. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   4. Do not close or obstruct roadways or sidewalks without permit.
   5. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise, and to permit continued Owner occupancy.
   1. Areas with roof decking exposed to interior spaces:
      a. Mechanically fasten 6 mil plastic sheeting to underside of exposed roof decking to catch debris during demolition and installation of new products.
      b. Repair damaged caused during installation of plastic sheeting.
      c. Remove tape, staples, and other fasteners during removal of plastic sheeting.

D. Protect interior spaces from dust and falling debris resulting from demolition activities.

E. Do not begin removal until built elements to be salvaged or relocated have been removed.

F. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

G. Protect existing free flowing roof drains from damage and clogging.

H. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.3 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not close, shut off, or disrupt existing life safety systems that are in use without 72 hours prior written notification to Owner.

C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without 72 hours prior written notification to Owner.

D. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

E. Disconnect utilities as required for the work after marking them for identification purposes.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Remove existing roofing and insulation noted.
      a. Set or remove projecting nails.
   3. Renail loose or badly warped roof sheathing and decking.
   4. Notify Architect of any decayed or substantially misaligned roof decking members.
   5. Execute cutting and demolition by methods to prevent damage to other work and to provide proper surfaces to receive installation of repairs. Use hand spudding techniques only. Saw cutting roof membranes is permitted only where existing roofs overlay existing rigid insulation and where existing roofs do not contain asbestos materials. Do not cut into roof deck.

C. Repair or replacement of dry rotted substrate where required will be performed by Owner, others, or Contractor on a negotiated basis at Owner's option. Do not remove damaged materials when exposed before examination by Architect or Engineer, followed by written approval and instructions.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.5 SELECTIVE ROOFING DEMOLITION

A. Typical roofing demolition: Remove roofing cap sheet and plies, flat and tapered insulation, vapor retarder, and associated cants and nailers to expose roof deck.

B. Roofing demolitions at Churchill High School: Remove roofing cap sheet and plies, flat and tapered insulation, loose vapor retarder material, and associated cants and nailers.

3.6 SELECTIVE MECHANICAL DEMOLITION

A. Remove AC Compressor located in MZ-1 mechanical room.

B. Remove condenser located on roof.

C. Remove demolished equipment, piping, and material site.

D. Recover R22 refrigerant from existing systems in accordance with EPA requirements and Section 23 23 00.

E. Provide schedule indicating when each existing unit will be ready for disconnection of electrical power and control wiring and when condensing unit will be removed.

3.7 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove and dispose of existing roofing materials discovered to contain asbestos in full compliance with DEQ, OSHA, City of Eugene, Lane County, LRAPA and APD. Comply with necessary notifications, testing, protection, and monitoring required by regulatory agencies.

C. Leave site in clean condition, ready for subsequent work.

D. Clean affected interiors and sweep floors daily during demolition.

E. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Sheathing.

C. Roof-mounted curbs.

D. Roofing nailers.

E. Preservative treated wood materials.

F. Miscellaneous framing and sheathing.

G. Concealed wood blocking, nailers, and supports.

H. Miscellaneous wood nailers, furring, and grounds.

1.2 RELATED REQUIREMENTS

A. Section 01 1100 – Summary of Work: Dryrot and Fungus Inhibitor furnished by Owner.

B. Section 02 41 00 - Demolition: Removal of existing construction and finishes.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.

D. Section 07 72 00 - Roof Accessories: Prefabricated roof curbs.

1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2012.

C. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; National Institute of Standards and Technology, U.S. Department of Commerce; 2010.

D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

E. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; West Coast Lumber Inspection Bureau; 2004, and supplements.

1.4 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.

B. Material Safety Data Sheets: Submit for wood treatment products.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified

requirements.

3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.2 DIMENSION LUMBER

A. Grading Agency: West Coast Lumber Inspection Bureau (WCLIB).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Cant Strips, Curbs, Grounds, and Furring:
   1. Lumber: S4S, No. 2, or Standard Grade.
   2. Boards: Standard or No. 3.

2.2 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.
   1. Manufacturers:
      a. Weyerhaeuser: www.weyerhaeuser.com.
      b. Boise Cascade: www.bc.com.
      c. Georgia-Pacific Corp.: www.gp.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 CONSTRUCTION PANELS

A. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing.
   1. Bond Classification: Exterior.
   2. Thicknesses: as required to match existing unless otherwise noted, and as indicated on Drawings.

B. Plywood Backing at Wall Flashing: C-D unsanded finish, exterior exposure group, thicknesses as shown on Drawings.

2.5 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Compression Pins: Fasteners of suitable size and type for intended use; Hilti OX series or approved.
   3. Expansion and Wedge Anchors: As manufactured by Simpson Strong-Tie.
   4. Structural Wood Screws: Strong-Drive SDS Structural Wood Screws by Simpson Strong Tie.
   5. Structural Concrete Screws: As manufactured by Hilti.

B. Wood Construction Connectors: As manufactured by Simpson Strong-Tie.

C. Steel Straps: As manufactured by Simpson Strong-Tie.

2.6 WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber in contact with roofing.
      c. Treat lumber in contact with masonry or concrete.
      d. Treat lumber in other locations as indicated.
   2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
      a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
      b. Treat plywood in contact with roofing, flashing, or waterproofing.
      c. Treat plywood in contact with masonry or concrete.
      d. Treat plywood in other locations as indicated.

C. Dryrot and Fungus Inhibitor: Clear preservative; as provided by Owner.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.2 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.

3.3 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.4 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Wood Curbs:
   1. Provide wood curb at all roof openings except where specifically indicated otherwise.
   2. Form corners by alternating lapping side members.
   3. Apply heavy coating of wood preservative in and around holes for exposed anchors.

3.6 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends

staggered and over firm bearing.
1. At long edges provide solid edge blocking where joints occur between roof framing members.
2. Nail panels to framing; staples are not permitted.

3.7 SITE APPLIED WOOD TREATMENT

A. Treat all wood in contact with concrete or masonry, and as indicated.

B. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

C. Allow preservative to dry prior to erecting members.

D. At dryrot repair that has incidental decay to remain, flood area with preservative before enclosing or covering.

3.8 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.9 CLEANING

A. Waste Disposal:
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 07 42 13
METAL WALL PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufactured metal panels for walls, with related flashings, and accessory components.

B. Formed steel furring channels.

1.2 RELATED REQUIREMENTS

A. Section 02 41 00 – Demolition: Selective demolition.

B. Section 07 62 00 - Sheet Metal Flashing and Trim.

C. Section 07 90 05 - Joint Sealers.

1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM C645-13 - Standard Specification for Nonstructural Steel Framing Members; 2011.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.

D. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.

E. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.

C. Samples: Submit two samples of each type of wall panel, 3 inch by 5 inch in size illustrating finish color, sheen, and texture.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

1.6 MOCK-UP

A. Construct mock-up, 10 feet (3 m) long by height of parapet; include panel system, attachments to building structure, weep drainage system, and flashings in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.8 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a five year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

C. Correct defective Work within a five year period after Substantial Completion, including defects in water tightness and integrity of seals.

PART 2 PRODUCTS

2.1 MANUFACTURED METAL PANELS

A. Wall Panel System: Preformed and prefinished metal panel system of vertical profile; site assembled.
   1. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
   2. Design Pressure: In accordance with applicable codes.
   3. Maximum Allowable Deflection of Panel: 1/90 of span.
   4. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   5. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
   6. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
   7. Corners: Factory-fabricated in one continuous piece with minimum 18 inch (450 mm) returns.
   8. Exterior Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
   9. Exterior Panel Back Coating: Panel manufacturer's standard polyester wash coat.

B. Panels:
   1. Minimum 24 gage thick precoated steel sheet.
   2. Flat profile; three intermediate low profile striations; 1-3/4 inch high interlocking standing seam.
   3. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets.
   4. Material: Precoated steel sheet, minimum 24 gage (0.6 mm) thick.
   5. Panel Width: 17 inches (430 mm).
   6. Color: As selected from manufacturer’s standard colors.

C. Internal Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

D. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

E. Anchors: Galvanized steel.

F. Product:
   1. Design Span by AEP Span Division of ASC Profiles, Inc: www.ascprofiles.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

A. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.3 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Sealants: Manufacturer's standard type suitable for use with installation of system; non-staining.
   1. Color: To be selected by Architect.

C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.

D. Field Touch-up Paint: As recommended by panel manufacturer.

E. Bituminous Paint: Asphalt base.

2.4 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest practicable lengths.

C. Form panels for standing seams.

D. Fabricate corners in one continuous piece with minimum 18 inch returns.

2.4 SUPPORT FRAMING SYSTEM

A. Provide framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Shop fabricate framing system to the greatest extent possible.

C. Deliver to site in largest practical sections.

D. Framing Materials:
   1. Furring Channels: ASTM C645; Ht-shaped sections, minimum depth of 7/8 inch.
      a. Galvanized in accordance with ASTM A653/A653M G90/Z275 coating.

E. Framing Accessories:
   1. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
   2. Plates, Gussets, Clips: Formed Sheet Steel, thickness determined for conditions encountered; finish to match framing components.
   3. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

F. Framing Accessories:
   1. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
   2. Anchorage Devices: Powder actuated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION OF SUPPORT FRAMING

A. Install components in accordance with manufacturers' instructions.

B. Secure in place with fasteners at maximum 24 inches (600 mm) on center.

C. Place furring channels at 24 inches (600 mm) on center. Shim as required to provide level and plumb plane for attachment of panels.

3.3 INSTALLATION OF PANELS

A. Install panels on walls in accordance with manufacturer's instructions.

B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.

C. Fasten panels to structural supports; aligned, level, and plumb.

D. Locate joints over supports. Lap panel ends minimum 2 inches.

E. Use concealed fasteners at horizontal panels unless otherwise approved by Architect.

F. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.4 TOLERANCES

A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.

B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 73 00 – Execution Requirements: Protecting existing and new installed construction and finishes from damage.

B. Protect walkways and work areas with plywood or insulation board.

C. Do not store materials on roof.

D. Protect installation and roof top fabrication as installation work occurs. Do not permit traffic over unprotected roof surface.

3.6 CLEANING

A. Remove site cuttings from finish surfaces.

B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION

SECTION 07 51 00
BUILT-UP BITUMINOUS ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Built-up roofing membrane, conventional application.

B. Insulation, flat and tapered.

C. Vapor retarders.

D. Cover board.

E. Base flashings.

F. Roofing cant strips and accessories.

1.2 RELATED REQUIREMENTS

A. Section 02 41 00 - Demolition: Removal of existing roofing and insulation systems.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings, reglets, and coping.

1.3 REFERENCE STANDARDS

A. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.

B. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.

C. ASTM D 312 - Standard Specification for Asphalt Used in Roofing; 2000 (Reapproved 2006).

D. ASTM D 1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

E. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2004.

F. ASTM D 2822 - Standard Specification for Asphalt Roof Cement, Asbestos-Containing; 2005.

G. ASTM D 3909/D 3909M - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules; 1997b (Reapproved 2012)e1.

H. ASTM D 4601/D 4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing; 2004 (Reapproved 2012)e1.

I. ASTM D5147 / D5147M - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material; 2011a.

J. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.

K. NRCA ML 104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

L. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

M. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of associated counterflashings installed by other sections as the work of this section proceeds.

B. Preinstallation Meeting: Convene one week before starting work of this section.
   1. See Section 01 31 00 - Project Management and Coordination, for pre-installation conference

procedures.
2. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Product Data: Provide data indicating membrane and bitumen materials, base flashing materials, insulation, vapor retarder, and cover board.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and setting plan for tapered insulation.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

D. Manufacturer's Field Reports: Indicate procedures followed and supplementary instructions given.

E. Material Safety Data Sheets: Submit data for roofing components installed in roofing membrane and related flashing.

F. Warranty: Submit 2-year installation warranty.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with manufacturer's instructions.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

C. Protect foam insulation from direct exposure to sunlight.

1.8 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 90 degrees F.

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.9 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Roofing, flashing, and deck insulation shall comply with a 2-year warranty, through the Contractor as called for in Section 00 73 00 - Supplementary Conditions, after date of Substantial Completion.

D. Roofing Contractor to warrant for proper placement of metal, provided by others as part of the Work, in contact with roofing.

E. Warranty to include annual inspections and repair maintenance during this two year period.

PART 2 PRODUCTS

2.1 APPROVED ROOF SYSTEMS

A. Approved Roof Systems With Modified SBS Surfacing on Nailable Deck. (Base, 3 plies, Cap):
   1. Johns Manville; 5FND; GlasBase, Three GlasPly Premier, GlasKap Plus SBS cap sheet. DFE flashing systems: GlasKap Plus.
   2. GAF; –B-3-601/P6; #75 base sheet, Three GAFGLAS ply Type VI, Rubberoid 30 FR (Granule) SBS Modified cap sheet, Modified Base flashing system: Rubberoid Mop FR (granule.)
   3. Malarkey; M5-VVU-AIB-H; 515 Base, Three Type VI 506 Ply 6, No. 601 Premium SBS Cap Sheet. Modified Base flashing system: No. 601 Premium SBS.
   4. CONGLAS; ND-36A- CMBH; CONBASE base sheet, Three CONPLY HT60 Type VI Plies, MB CAP 100 mineral surface cap sheet, Modified Base flashings system: Conform base flashing.
   5. Certainteed; GMS-N-B5: GlasBase, three FlintGlas Premium Ply Type VI, Flintlastic GMS Mineral surfaced cap sheet. Modified Base flashing system: Flintlastic GMS.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Approved Roof Systems with Modified SBS Surfacing over Rigid Insulation. (4 plies, Cap):
   1. Johns Manville; 5FID; Four GlasPly Premier Type VI plies, GlasKap Plus SBS cap sheet. DFE flashing systems: GlasKap Plus.
   2. GAF; 1-4-1-601/PR; Four GAFGlas Type VI plies, Rubberoid 30 FR (Granule) SBS Modified cap sheet, Modified Base flashing system: Rubberoid Mop FR (granule.)
   3. Malarkey, M5-WI-XIB-H; Four No. Type VI 506 Ply, No. 601 Premium SBS cap sheet, Modified Base flashing system: 601 Premium PolyGlas SBS.
   4. ConGlas; RI-46 (none)- CMBH; Four Conply HT60 Type VI plies, MB CAP 100 cap sheet, Modified Base flashing system: Conform by ConGlas.
   5. Certainteed; GMS-C-P5: Four FlintGlas Premium Ply Type VI, Flintlastic GMS Mineral surfaced cap sheet. Modified Base flashing system: Flintlastic GMS.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROOFING - CONVENTIONAL APPLICATION

A. Roofing Assembly Requirements:
   1. Roof Covering External Fire Resistance Rating: UL Class A.

B. Roofing Assembly Requirements:
   1. Factory Mutual Classification: Class 1 and windstorm resistance of I-90, in accordance with FM DS 1-28.

2.3 SHEET MATERIALS

A. Base Sheet: ASTM D 4601 Type II; asphalt-coated Glass fiber; unperforated.

B. SBS Modified Base sheet: ASTM D4601 Type !!, SBS rubber modified asphaltic sheet, Glass fiber; unperforated.

C. Roofing Felt: ASTM D 2178; Asphalt-saturated Glass fiber felt; Heavy Duty, Type VI, Table 1.

D. Mineral Surface Cap Sheet: ASTM D 3909; Asphalt-saturated Glass fiber roll roofing; white colored mineral granules, 78 lbs/100 sq. ft.

E. SBS Mineral Surfaced Cap Sheet: ASTM D 5147, Glass fiber reinforced membrane with synthetic rubber, 100 lbs/100 sq. ft.

F. Flexible Flashing Material: Modified bitumen, SBS type; conforming to the following:
   1. Elasticity: 50 percent with full recovery without set.
   2. Color: White granule surfacing ungranulated or primed when covered..

2.4 BITUMINOUS MATERIALS

A. Bitumen: ASTM D 312 Type III or IV.
   1. Slope Less than 2:12: Type III.

2. Slope 2:12 or Greater: Type IV.

B. Primer: ASTM D 41, asphalt type.

C. Roof Cement: ASTM D 2822, Type I, cutback asphalt type.

D. Flashing Cement: Fiberglass plastic cement, Fed Spec SS-C-153, Type 1.

E. Mastic: Neoprene base material; compatible with materials to be adhered.

F. Emulsified Asphalt: ASTM D 1227; with fiber reinforcement (Type I or II).

2.5 INSULATION

A. Tapered Insulation System: Closed cell polyisocyanurate foam core bonded to fiberglass reinforced facers, complying with ASTM C 1289:
   1. Slope: 1/8 inch per foot and 1/4 inch per foot.
   2. Sizes: 2-foot x 4-foot and 4-foot x 4-foot sheets.
   3. Thicknesses: 1-1/2 inches and 2 inches.
   4. Manufacturers:
      a. Tapered Fesco Board Roof Insulation by Johns Manville.
      b. Energy Guard Perlite Tapered Roof Insulation by GAF.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Flat Insulation System: Closed cell polyisocyanurate foam core bonded to fiberglass reinforced facers, complying with ASTM C 1289.
   1. Thicknesses: 1-1/2 inches and 2 inches.
   2. Thermal Resistance:
      a. R-value of 6.0 per inch thickness.
      b. Total R-value: Minimum 20.0
   3. Board Edges: Square.
   4. Products:
      a. ENRGY 3 by Johns Manville.
      b. Substitutions: As recommended by Built-up Roofing Systems manufacturers.

2.6 VAPOR RETARDER SYSTEMS UNDER INSULATION

A. Vapor retarder products are to be the same manufacturer as roofing system.

B. On Nailable Deck: Include the following minimum materials per 100 square feet:

1.	Glass base sheet nailed to deck. 1 Ply	22 lbs.
2.	1 inner ply mopped to base sheet, ASTM D2178, Type VI,	11 lbs.
3.	Asphalt to embed insulation	33 lbs.
4.	Approximate Total Minimum Weight	66 lbs.

C. On Concrete Deck: Include the following minimum materials per 100 square feet:

1.	Primed concrete deck and remaining vapor barrier.	
2.	Modified Glass base sheet mopped to concrete deck.	33 lbs.
3.	Asphalt to embed insulation.	33 lbs.
4.	Approximate Total Minimum Weight	66 lbs.

2.7 ACCESSORIES

A. Cover Board: ASTM C 728, expanded perlite and cellulosic fibers, top surface coated for bonding bituminous membranes; 4 x 4 foot or 4 x 8 foot sheets; 1/2 inch thickness; board density of 14.5 pcf.
   1. RetroPlus Roof Bard by Johns Manville.
   2. FiberBase HD by Temple-Inland.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cant and Edge Strips: Bitumen-impregnated fiberboard, compatible with roofing materials; cants formed to 45 degree angle, tapered edge strips, and other configurations as detailed.
   1. Manufacturers:
      a. Johns Manville.
      b. GAF.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Fasteners to Wood Deck:
   1. Tape and Staple System: Similar to Senco base sheet tape system with divergent point 3/4 and 7/8 inch leg staples or approved.
   2. Nails: Galvanized annular ring shank nails through flat tin discs, 7/8 inch long for 3/4 inch minimum penetration.

D. Strainers and Clamping Rings: Reuse or provide new steel clamping rings and strainers to match existing.

E. Sheathing Paper: 9.0 to 11.4 mils; 0.03 to 0.034 lbs per square feet; Red Rosin Paper by W.R. Meadows, or approved.

F. Flashing Boots: Neoprene boot with tongue-and groove sealing lips; serviceable range from -60 degrees F to 270 degrees F; stainless steel hardware; sized to fit application; adaptors for round and non-round penetrations and for multiple penetrations.
   1. Manufacturers:
      a. Portals Plus; Retrofit Flashing Systems: www.portalsplus.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 GENERAL

A. Interruption of Work: In general, complete areas being roofed in their entirety each day. At end of each work day, leave uncompleted roofs in a manner to prevent moisture form entering and damaging the building and roofing system.

B. Blending New and Existing Roofing: Prime existing roof with asphalt primer 24 hours prior to roofing. Blend new roofing with existing by overlapping new base ply minimum 6 inches beyond edge of existing roofing and overlapping each successive new ply 6 inches beyond ply below. Broom or press felts together, providing tight, smooth, wrinkle-free lamination.

3.2 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure. Do not store materials within 6 feet of edge of roof.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.3 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.

B. When uncovered work is found to be loose or with raised fasteners above the sheathing face, re-nail board or panel sheathing tight to structure with fasteners complying with Code and applicable to roof sheathing encountered. Locate fasteners in sound material not previously used. Resetting of existing fasteners acceptable only with Architect and District Project Representative's specific approval.

C. Cover knot holes and voids in wood decks greater than 3 inches with sheet metal nailed securely to deck.

D. Coordinate installation of roof mounted components and other items projecting through roof. Verify roof openings are framed, sized, and located prior to installing work of this Section.

3.4 CONCRETE DECK PREPARATION

A. Where existing vapor retarder is adhered to deck, spud surface smooth.

B. Where existing topping slab or concrete deck is exposed, fill surface variations with latex filler.

3.5 VAPOR RETARDER INSTALLATION

A. Base sheet installation:
   1. Education Center:
      a. Nail base sheet to deck.
      b. Install one ply sheet in uniform mopping of asphalt; minimum 11 lbs./square.

   2. Churchill High School: Installation at Churchill High School:
      a. Fill voids to topping slab caused by tear-off with latex filler. Allow proper curing time.
      b. Fully prime exposed slab and remaining vapor retarder.

   3. Install one ply sheet in uniform mopping of asphalt over existing vapor retarder; minimum 33 lbs./square.

C. Extend vapor retarder under cant strips and blocking.

D. Mop bitumen glaze over vapor retarder assembly to be left exposed overnight prior to installation of insulation and inner ply assembly.

3.6 INSULATION INSTALLATION

A. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.

B. Attachment of Insulation: Embed insulation in flood coat mopping of hot bitumen in accordance with roofing and insulation manufacturers' instructions; minimum 33 lbs./square.

C. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

E. Thoroughly walk-in at individual insulation boards to ensure maximum adhesive contact.

F. Stagger short joints 24" minimum. Stagger end and edge joints 12" minimum to subsequent layers of rigid insulation.

G. Install tapered edge strips as for transition between differing roof planes and exposed insulation edges.

H. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches (450 mm).

I. Do not apply more insulation than can be covered with membrane in same day.

3.7 MEMBRANE APPLICATION

A. Equiviscous Temperature (EVT) at Point of Application: In accordance with NRCA recommendations.

B. Apply membrane plies, weather lap edges and ends, and mop with 20 lb/square of bitumen per ply. Apply plies 2 on 2 in same direction.

C. Install mineral cap sheet in shingle fashion, parallel to roof ridge. Install in maximum 12 foot

lengths. Set in continuous uniform mopping of asphalt. Broom in. Seed asphalt edges with matching white granules.

D. Apply smooth, free from air pockets, wrinkles, fish-mouths, or tears.

E. At end of day's operation, install two plies membrane and bitumen glaze coat for cut-off. Glaze exposed felts. Remove cut-off before resuming roofing.

F. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
   2. Mop on base flashing of two additional plies of felt and one ply of flexible base flashing material.
   3. Secure flexible base flashing to nailing strips at 4 inches on center.

G. Around roof penetrations, mop in and seal flanges and flashings with two additional stripping plies of felt.

H. Coordinate installation of roof drains and related flashings.

I. Repair fish-mouths by cutting plies, secure and repair area by using manufacturer's recommendations for repairing test cuts.

J. Existing Cast Iron Roof Drains: Install new or restore existing clamping rings and strainers at existing cast iron roof drains. Verify that drains are free-flowing at completion of Work.

3.8 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.

B. Roof Cut-out Samples:
   1. Make either one sample per 5,000 square feet or three samples in locations directed by Architect.
   2. Cut out samples 4 inches x 48 inches perpendicular to the direction of the roofing.
   3. Repair roof at sample locations to new condition.
   4. On roofs where samples fail to meet manufacturer's minimum standards, apply additional felts and bitumen, or replace entire roof assembly, as directed by Architect.
   5. Perform sampling, sample site repairs, and remedial roofing at no additional cost to Owner.

C. Require site attendance of roofing material manufacturers at least once during installation of the Work.

3.9 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.10 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Mechanically attached system with thermoplastic roofing membrane.

B. Insulation, flat.

C. Deck Sheathing.

D. Cover Board.

E. Flashings.

1.2 RELATED REQUIREMENTS

A. Section 02 41 00 - Demolition: Removal of existing roofing and insulation.

B. Section 06 10 00 - Rough Carpentry: Wood nailers.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Membrane clad metal flashing furnished under this section and installed by sheet metal subcontractor.

1.3 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.

B. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2013.

C. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2011a.

D. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.

E. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

F. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.

C. Specimen Warranty: For approval.

D. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout for perimeter wind uplift conditions and general field conditions.

E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section:
   1. With minimum five years documented experience.
   2. Approved by membrane manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

C. Protect foam insulation from direct exposure to sunlight.

1.7 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 20 years, NDL (No Dollar Limit.)
   2. For repair and replacement include costs of both material and labor in warranty.
   3. Exceptions NOT Permitted:
      a. Damage due to roof traffic.
      b. Damage due to wind of speed greater than 56 mph but less than 90 mph.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Thermoplastic Polyolefin Membrane Materials:
   1. Carlisle SynTec; : www.carlisle-syntec.com.
   2. Firestone Building Products Co; : www.firestonebpco.com.
   3. GAF: www.gaf.com.
   4. Johns Manville: www.jm.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROOFING

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered system as follows:
   1. Roofing Assembly Type 1: One ply membrane, separator board, mechanically fastened tapered rigid insulation where shown, and vapor retarder over plywood roof deck.

B. Roofing Assembly Requirements:
   1. Roof Covering External Fire-Resistance Classification: UL Class A.
   2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.

2.3 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D 6878.
   2. Reinforcing: Internal fabric.
   3. Thickness: 0.060 inch, minimum.
   4. Sheet Width: Factory fabricated into largest sheets possible.
   5. Color: To be selected by Architect from manufacturer's full color range.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Fasteners: Manufacturer's standard.

D. Flexible Flashing Material: Same material as membrane.

2.4 DECK SHEATHING AND COVER BOARDS

A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire-resistant type, paper face, 5/8 inch (16 mm) thick.

B. Cover Board: Glass mat-faced, water and moisture-resistant gypsum board, UL Class A fire rated; 1/4 inch thick; 150 psi compressive strength.
   1. Invinsa FR Roof Board by Johns Manville: www.jm.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.5 INSULATION

A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type I, aluminum foil both faces; Class 1, non-reinforced foam core.

A. Physical Characteristics:
   1. Board Size: 48 x 48 inch and 48 x 96 inch.
   2. Board Edges: Square.
   3. Thickness: As required by Drawings.
   4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.

2.6 ACCESSORIES

A. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.

B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.

C. Insulation Adhesive: As recommended by insulation manufacturer.

D. Sealants: As recommended by membrane manufacturer.

E. Cement-Based Grout: ASTM C 1107; nonshrink, noncorrosive, nonmetallic, pourable.

F. Membrane Adhesive: As recommended by membrane manufacturer.

G. TPO-Coated Metal: Non-reinforced TPO membrane laminated to 26 gauge galvanized steel; white.

H. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

I. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

J. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

K. Walkway Pads: Type as recommended by membrane manufacturer; size as indicated.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be

weatherproofed the same day.

F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

3.2 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is clean and suitable for installation of roof system.

C. Verify deck surfaces are dry and free of snow or ice.

3.2 METAL DECK PREPARATION

A. Install deck sheathing on metal deck:
   1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
   2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
   3. Tape joints.
   4. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.
      a. Over entire roof area, fasten sheathing using 6 fasteners with washers per sheathing board.

3.3 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.

3.4 INSULATION - UNDER MEMBRANE

A. Mechanically fasten each individual layer of insulation as required to hold in place until cover board is installed.

C. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter.

F. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

F. Do not apply more insulation than can be covered with membrane in same day.

3.5 COVER BOARD - UNDER MEMBRANE

A. Install cover board over insulation, and mechanically fasten using six insulation fasteners and plate washers per 4-foot x 8-foot board.

3.6 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

D. Mechanical Attachment: Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.

E. At intersections with vertical surfaces:
   1. Extend membrane up a minimum of 4 inches (100 mm) onto vertical surfaces or as indicated on Drawings.
   2. Fully adhere flexible flashing over membrane and up to reglets.

F. Around roof penetrations, seal flanges and flashings with flexible flashing.

G. Coordinate installation of roof drains and sumps and related flashings.

3.7 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.

B. Require site attendance of roofing and insulation material manufacturers weekly during installation of the Work.

3.8 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.9 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, downspouts, and other items indicated in Schedule.

B. Retrofit pipe flashings.

1.2 RELATED REQUIREMENTS

A. Section 02 41 00 - Demolition: Removal of existing flashing and roofing.

B. Section 07 42 13 - Metal Wall Panels.

C. Section 07 51 00 – Built-up Bituminous Roofing.

D. Section 07 54 00 - Thermoplastic Membrane Roofing

E. Section 07 90 05 – Joint Sealers.

1.3 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011.

B. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.

C. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

D. ASTM B 32 - Standard Specification for Solder Metal; 2008.

E. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products; 2003 (Reapproved 2009).

F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, expansion joints, and installation details.

C. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

D. Material Safety Data Sheets: Submit data for specified products and related primers, paints, and coatings, solvents, caulking, and sealants.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene one week before starting work of this section.

B. See Section 01 31 00 - Project Management and Coordination, for procedures.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

1.8 WARRANTY

A. Provide written 2-year warranty covering work of this Section, including, but not limited to, repair and replacement of sheet metal and flashings that leak or otherwise fail to perform as required due to failure of materials and workmanship. Warranty to include annual inspections.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; 24 gauge or as indicated on Drawings; pre-primed finish.

B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Architect from manufacturer's standard colors.

C. Stainless Steel: ASTM A 666 Type 304, soft temper, 0.015 inch thick; smooth No. 4 finish.

D. Lead: ASTM B 749, Type L51121, copper-bearing sheet lead, minimum 2 lb/sq. ft., except 4 lb/sq. ft. at clamping roof drains.

E. General Sheet Metal for Fabricated Vents and Intakes: Galvanized iron copper-bearing base metal with commercial weight zinc coating; gauge as indicated on Drawings.

F. Scuppers and Overflows, Splash Pan Flashings, and Pitch Pocket Receivers: .020 inch or gauges as shown; soft temper stainless steel, Type 304, 18-8 2D finish; Duroflash by Republic, or approved.

2.2 ACCESSORIES

A. Fasteners:

   1. General: Same material and finish as flashing metal, with soft neoprene washers.

   2. Screws and Nails: To match with connecting materials, complete with neoprene washers.

   3. Self-drilling Fasteners: Cadmium-plated, with 2-piece neoprene and steel sealing washer, in appropriate thickness and length for the materials being fastened; Buildex Teks, or approved.

   4. Anchorage Devices: Powder actuated, corrosion-resistant, 0.145 inch shank diameter, length as required to achieve minimum 3/4 inch embedment.
      a. X-CR by Hilti.
      b. Ramguard Pins by Ramset.
      c. PDPxx by Simpson Strong-Tie.
      d. Substitutions: Section 01 60 00 - Product Requirements.

B. Primer: Zinc chromate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Sealant: Type B - MS-Polymer specified in Section 07 90 05.

E. Plastic Cement: ASTM D 4586, Type I.

F. Solder: ASTM B 32; Sn50 (50/50) type.

G. Cleats: Same material and thickness as sheet metal.

H. Sheet Metal Primer: Primer, as specified in Section 09 90 00 – Painting and Coating: Galvanized materials.

I. Pitch Pocket Material: Elastomeric sealant; Goodyear, Firestone, Gaco or approved.

J. Protective Coating for Dissimilar Metals: Asphalt plastic cement.

K. Bedding Compound: Butyl.

L. Flashing Cover and Backing Plates: Material, gauge, and profile to match flashing.

M. Globe and Rotary Type Roof Ventilators: Galvanized units with tapered base assemblies, sizes to match existing or as shown; GV, RV, and J-Vent series by Artis, or approved.

N. Flux: FS 0-F-506.

O. Building Paper: ASTM D226, 15 lb., unperforated asphalt felt.

P. Insect Screen: Stainless steel; 18 x 16 size mesh.

Q. Downspout supports: In accordance with SMACNA requirements, brackets to suit profile.

R. Retrofit Pipe Flashings:

1. 60 mil neoprene compression molded body.
2. Serviceable temperature range of -60 F to +270 F.
3. Resistant to ozone and ultraviolet light.
4. Tongue and groove sealing lips with overlapping tab to flash the seam.
5. Stainless steel hardware.
6. Portals Plus Retrofit Flashings, or approved.

2.3 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with standing seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

G. Fabricate flashings to allow toe to extend as shown on Drawings. Return and brake edges.

H. Fabricate cleats of same material as sheet, minimum 3 inches wide, interlockable with sheet.

I. Form sheet metal pans (pitch pockets) 6 inch nominal size, with 4 inch upstand, and 6 inch flanges.

J. Provide anchors, anchor straps, receivers, and clips as shown on Drawings and as required to complete the Work.

K. Fabricate plumbing vent counterflashing and roof drain flashings with sheet lead. Verify length required at plumbing vents for full height installation.

L. Fabricate scuppers, splash pans, and pitch pocket receivers with soft temper stainless steel. Fully solder seams.

M. Provide minimum 6 inch wide cover plates and backing plates at all cap metal flashing joints. Allow for expansion.

N. Fabricate gutters in accordance with SMACNA Architectural Sheet Metal Manual, Rectangular profile. sections true to shape, accurate in size, square, and free from distortion or defects.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.3 SALVAGE AND RE-USE OF EXISTING ITEMS

A. Remove and replace existing sheet metal items and systems with new material where noted on Drawings.

B. Remove, mark for location, store and reinstall existing sheet metal items and systems which are indicated to be reused. Coordinate with Section 02 41 00 – Demolition.

C. Remove, wire-brush clean, repaint, and reinstall existing sheet metal air vents, roof vents, exhaust fan housings, and other items indicated to be reused. Repair or replacement of existing materials lost, damaged, or otherwise rendered unusable shall be approved by Architect.

3.4 INSTALLATION

A. General:

1. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
2. Apply plastic cement compound between metal flashings and felt flashings.
3. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
4. Seal non-soldered metal joints watertight.
5. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

B. General Sheet Metal.

1. Make exterior work permanently watertight.
2. Prime and paint with one heavy coat of protective coating where any metal comes in contact with dissimilar metal.
3. Caulk all sheet metal at locations shown or as required to complete a watertight installation.

C. Cover Plate Seams:

1. Space abutting sheets 1 inch. Cover joint with 6 inch wide cover and backing plates. Match plates to flashing profile. Cover plate drip edge to clip over top of cap metal drip edge.
2. Secure plates to substrate with two flat head screws installed through open space between

flashing sheets. Embed cap metal in two beads of sealant.

D. S-Lock Seams: Form 1-1/4 inch wide shaped seam on one edge of flashing sheet for concealed fastening.

E. Pipe Flashing System: Install where indicated on Drawings. Follow manufacturer's installation recommendations.

F. Cleats:

1. Space 2 feet on center, unless other spacing or continuous cleats are specified.
2. Secure spaced cleats to substrate with 2 fasteners. Secure continuous cleats to substrate with fasteners spaced at 12 inch maximum centers.
3. Cover fastener heads with cleat tabs.

G. Existing Plumbing Vent Pipe Flashings.

1. Fabricate with sheet lead in full height profile, plus 1-1/2 inch to allow rolling flashing into pipe. Do not use two-piece flashings.
2. Furnish to roofer for installation.

H. Existing Cast Iron Roof Drains: Furnish new lead flashing collars to roofer for installation.

I. Existing Roof Exhausters to be Reinstalled:

1. Replace if damaged during removal.
2. Fabricate new counterflashing flange in pre-finished galvanized sheet metal at existing roof exhausters.
3. Securely fasten to existing collars or frames with pop rivets at each side.
4. Furnish to roofer for reinstallation with location instructions.

J. Stainless Steel Pans: Prime surfaces of flanges to be stripped into built-up roofing.

L. Pitch Pockets:

1. Install sheet metal receiver to built-up roofing where shown on Drawings.
2. Install in two pieces where shown on Drawings.
3. Secure flange to roofing with flashing cement.
4. Fill pan with elastomeric cement or as indicated on Drawings.

N. Miscellaneous Flashings: Install flashing around doors, louvers, windows and other openings in exterior walls in the area of Work, where indicated on Drawings, and where necessary to make building watertight.

O. Downspouts:

1. Secure downspouts in place using concealed fasteners.
2. Connect downspouts to existing downspouts.

3.5 SCHEDULE

LOCATION	METAL TYPE	THICKNESS	FINISH
A. Metal Flashing:	Formed Prefinished Steel	24 Gage	Kynar
B. Pan Flashing:	Formed Stainless Steel	0.0187 inch	No. 4
C. Coping:	Formed Prefinished Steel	24 Gage	Kynar
D. Reglet & Counterflashing:	Formed Prefinished Steel	24 Gage	Kynar

E. Splash Pans:	Formed Stainless Steel	0.020 inch	No. 4
F. Downspouts:	Formed Prefinished Steel	24 Gage	Kynar
G. Pitch Pocket Receivers:	Formed Stainless Steel	0.020 inch	No. 4
H. Scuppers and Overflows	Formed Stainless Steel	0.020 inch	No. 4

END OF SECTION

SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof control and expansion joint covers.

1.2 RELATED REQUIREMENTS

A. Section 07 51 00 - Built-up Bituminous Roofing

B. Section 07 90 05 - Joint Sealers.

1.3 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011.

B. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual details.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Expansion Joint Covers:
   1. Johns Manville Corporation; Model EJ: www.jm.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

A. Control and Expansion Joint Covers: Composite construction of 6 inch wide flexible EPDM flashing of white color with closed cell urethane foam backing, each edge seamed to stainless steel flanges, designed for nominal joint width of 3 inches. Include special formed end caps and wall flashings, each sealed watertight.

2.3 ACCESSORIES

A. Sealant: As recommended by expansion joint cover manufacturer.

2.4 FINISHES

A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.2 INSTALLATION

A. Install components in accordance with manufacturer's instructions.

B. Conform to SMACNA Architectural Sheet Metal Manual drawing details as noted: Figure 5-4B.

C. Coordinate installation of components of this section with installation of roofing membrane and base flashings.

D. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

END OF SECTION

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof-mounted supports for mechanical and electrical equipment and devices.

B. Roof hatches, manual and automatic operation, including smoke vents.

1.2 RELATED REQUIREMENTS

A. Section 07 51 00 – Built-up Bituminous Roofing.

B. Section 23 05 00 – Basic HVAC Requirements.

C. Section 26 05 00 – Basic Electrical Requirements.

1.3 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Plate; 1999 (2009).

D. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.

E. UL (BMD) - Building Materials Directory; current edition.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.
   5. For smoke hatches, submit evidence of approval by evaluation agency specified.

C. Certificate: For smoke hatches, provide certificate of approval from authority having jurisdiction.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with manufacturer's instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

PART 2 PRODUCTS

2.1 NON-PENETRATING ROOFTOP ASSEMBLIES

A. Non-Penetrating Rooftop Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly.
   1. Design Loadings and Configurations: As required by applicable codes.

2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M; neoprene washers where fastening to ductwork.

B. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.
1. Attachment/Support Fixtures: As recommended by manufacturer; corrosion-resistant material.

C. Duct Supports: As recommended by manufacturer; corrosion-resistant material.

D. Non-Penetrating Pedestals: Square or rectangular bases.
1. Bases, Contractor's Option:
a. High density polypropylene.
b. Molded Recycled Rubber.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

E. Manufacturers:
1. KeyCurb Strut KS8 by RoofTop Accessories (www.keycurb.com).
2. RTB-01 by Roof Top Blox (www.rooftopblox.com).
3. Substitutions: See Section 01 60 00 - Product Requirements.

2.1 ROOF HATCHES, MANUAL AND AUTOMATIC OPERATION

A. Manufacturers - Smoke Vent Roof Hatches:
1. Bilco Company; Type DSH (double leaf): www.bilco.com.
2. Milcor, Inc; U-LPAG: www.milcorinc.com.
3. Babcock-Davis; SafeMAX Double Door: www.babcockdavis.com
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Roof Hatches: Factory-assembled steel frame and cover, complete with operating and release hardware.
1. Style: Provide flat metal covers unless otherwise indicated.
2. Mounting: Provide frames and curbs suitable for mounting conditions indicated on the drawings.
3. Smoke Hatches: Where "smoke" or "smoke/heat" operation is indicated, provide the following additional features and omit manual operation for access:
a. Smoke Release Mechanism: Automatic opening on melting of replaceable UL-listed fusible link at 165 deg F (74 deg C).
b. UL-listed as automatically operated smoke and heat vent.
c. Fire Alarm Connection: Provide separate resettable electrical link release mechanism and connection point for fire alarm system.
4. Size(s): As indicated on drawings; single-leaf style unless indicated as double-leaf.
5. For Smoke Venting Without Access: 48 by 90 inches (1220 by 2286 mm).

C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Material: Galvanized steel, 14 gage, 0.0747 inch (1.90 mm) thick.
2. Finish: Factory prime paint.
3. Insulation: 1 inch (25 mm) rigid glass fiber, located on outside face of curb.

D. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf (475 kPa) load.

2. Hinges: Heavy duty pintle type.
3. Hold open arm with vinyl-coated handle for manual release.
4. Latch: Upon closing, engage latch automatically and reset manual release.
5. Manual Release: Pull handle on interior.
6. Smoke Hatches: Manual release operation not to disturb automatic release mechanisms; easy resetting by Owner's maintenance personnel; provide latch designed to prevent relatching unless the automatic release mechanism has been properly reset for automatic operation.
7. Locking: Padlock hasp on interior.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify that surfaces are clean and smooth and suitable for installation of supports systems.

3.2 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Remove existing vertical supports from ductwork. Patch holes in ductwork that will not be reused.

3.3 INSTALLATION - EQUIPMENT SUPPORTS

A. Field customize to fit existing condition or as specified herein.

B. Set bases and support framing in locations indicated on Drawings.

C. Sweep any loose debris before setting supports, apply slip sheet or pad if required by roofing manufacturer.

D. Adjust all frame structures to required height and weight, assemble framing, supports, and hangers as required to support equipment.

E. Adjust each required hanger or clamp to its desired height, check each support for equal weight disbursement.

F. Fasten vertical directly to ductwork at side-mount applications.

3.4 INSTALLATION - ROOF HATCHES

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity.

3.5 CLEANING

A. Clean installed work to like-new condition.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 90 05
JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sealants and joint backing.

1.2 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Sealants required in conjunction with sheet metal work.

1.3 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants, 2011.

B. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2010.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, and color availability.

C. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

D. Material Safety Data Sheets: Submit data for specified products.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.6 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.7 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a two year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 GENERAL

A. Sealants and Primers: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

2.2 SEALANTS

A. MS Polymer Sealant (Type B): ASTM C920, Type S, Grade NS, Class 100/50; single or two-part component silyl-terminated polyether, moisture curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type; multiple colors as selected to match adjacent materials; meeting the following minimum requirements:
   1. Capability: +/- 50 percent
   2. Service Temperature Range: -40 to 220 degrees F.
   3. Shore A Hardness Range: +10 to +20
   4. Products:
      a. Sonolastic 150 VLM by BASF Construction Chemicals, LLC: www.buildingsystems.basf.com.
      b. Substitutions: Section 01 60 00 - Product Requirements.

B. Elastomeric Sealant: ASTM D4586, Type 1; rubberized, SBS modified, asphaltic sealing compound, black, trowel grades; meeting the following minimum requirements:
   1. Capability: +/- 50 percent
   2. Service Temperature Range: -40 to 220 degrees F.
   3. Shore A Hardness Range: +10 to +20
   4. Products:
      a. Sonolastic 150 VLM by BASF Construction Chemicals, LLC: www.buildingsystems.basf.com.
      b. Substitutions: Section 01 60 00 - Product Requirements.

2.3 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; closed cell polyethylene; bond breaker type; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C 1193.

C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   1. Width/depth ratio of 2:1.
   2. Neck dimension no greater than 1/3 of the joint width.

3. Surface bond area on each side not less than 75 percent of joint width.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Protect sealants until cured.

3.6 SCHEDULE

A. MS Polymer:
   1. Sheet metal work, unless otherwise indicated.
   2. Other joints at indicated on Drawings.

B. Elastomeric Sealant:
   1. Cap metal joints at backing plates.
   2. Edge metal lap joints.
   3. Other joints at indicated on Drawings.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Schedule - Surfaces to be Finished.

1.2 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Pre-primed sheet metal and existing mechanical and HVAC equipment to be finish painted.

1.3 REFERENCE STANDARDS

A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

B. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on all finishing products, including VOC content.

C. Samples: Submit two paper chip samples, 8-1/2 x 11 inch in size illustrating range of colors available for each surface finishing product scheduled.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

F. Material Safety Data Sheets (MSDS): Provide MSDS for specified products and related products to be used, including thinners, solvents, strippers, and fillers.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.7 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Paints:
1. Base Manufacturer: As specified below.
2. Glidden Professional (Devoe): www.gliddenprofessional.com.
3. Benjamin Moore & Co: www.benjaminmoore.com.
4. PPG Architectural Finishes, Inc: www.ppgaf.com.
5. Sherwin-Williams: www.sherwin.com.
6. Miller Paint Co: www.millerpaint.com.
7. Parker Paint: www.parkerpaint.com
8. Rodda Paint: www.roddapaint.com.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
3. Supply each coating material in quantity required to complete entire project's work from a single production run.
4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Colors: To be selected from manufacturer's full range of available colors.
1. Selection to be made by Architect after award of contract.

D. Volatile Organic Compound (VOC) Content:
1. Provide coatings that comply with the most stringent requirements specified in the following:
a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
b. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
1) Opaque, Flat: 50 g/L, maximum.
2) Opaque, Nonflat: 150 g/L, maximum.
c. Architectural coatings VOC limits of State of Oregon.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.3 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Pre-primed Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

H. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

I. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

J. Existing Roof Top Equipment: Clean thoroughly; remove loose, scaley and other defective film; fill hoes and cracks. Remove gloss by washing and sanding; touch up bare spots with proper primer type.

K. Exterior Wood Items to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after applying prime coat.

L. Plastic, ABC, PVC: Sand lightly and wipe with solvent appropriate for preparing material to receive paint.

3.3 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5 SCHEDULE - SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically noted.
   2. Fire rating labels, equipment serial number and capacity labels.
   3. Stainless steel items.
   4. Rubber.
   5. Elastomeric sealants.
   6. Portions of existing buildings where no alterations occur

B. Paint the surfaces described below under Schedules.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
   1. Paint conduit to match background surfaces, unless otherwise indicated.

3.6 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

A. Section 07 62 00 - Sheet Metal Flashing and Trim:
   1. Finish exposed surfaces; back prime concealed surfaces.

3.7 PAINTING SCHEDULE

A. General:
   1. Prime coats specified below may be omitted where factory applied shop coats are specified in other Sections.
   2. Prime coats specified below may be omitted from existing surfaces to be recoated, provided the existing coating is sound.
   3. The number of coats specified below is minimum. Apply additional coats where necessary for deep tone colors. Finish work shall be even, free from cloudy and mottled surfaces, and of uniform color.
   4. Film thickness specified below include primer.

B. Exterior surfaces.
   1. Paint System 1: Wood and Medium Density Overlaid Plywood (MDO) - Painted.
      a. One coat of acrylic primer sealer. PPG 17-921 Seal Grip
      b. Two coats of acrylic latex enamel, satin finish. PPG / Glidden Professional 2402-xx.
      c. Minimum Dry Thickness: 4.0 mils.
   2. Paint System 2: Steel - Shop-Primed.
      a. Touch-up with multipurpose primer, PPG 6-209 Speed Hide Primer
      b. Two coats of acrylic latex enamel, satin finish. PPG / Glidden Professional 2402-xx.
      c. Minimum Dry Thickness: 4.0 mils.
   3. Paint System 3: Sheet Metal, Steel and pre-manufactured Galvanized Anchors and Plate Washers.
      a. One coat flat latex primer. PPG 90-712 DTM Primer

b. Two coats of acrylic latex enamel, satin finish. PPG / Glidden Professional 2402-xx.
c. Minimum Dry Thickness: 4.0 mils.

4. Paint System 4: Reinstalled and new exhaust fans, roof ventilators, flue flashing, and existing metal downspouts.
   a. One coat galvanized metal latex primer. PPG 90-712 DTM Primer
   b. Two coats semi-gloss latex enamel. PPG / GliddenProfessional 2406-xx
   c. Minimum Dry Thickness: 3.0 mils.

C. Existing surfaces affected by new construction.
   1. Patch, repair, and paint existing surfaces to remain.
   2. Carry to nearest break line.
   3. Prime cut on exposed edges.
   4. Repair as per paint Schedule.

D. New and affected surfaces, exposed components and fasteners.
   1. Color to match adjacent surfaces unless noted otherwise.

E. Paint all new and existing roof top equipment and sheet metal except pre-finished metal and large mechanical units and condensing units.

END OF SECTION

SECTION 23 05 00
BASIC HVAC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Labor and equipment required to remove, lift, remodel, reset, and reinstall and reconnect existing roof mounted equipment as part of roofing and seismic improvement work.

1.2 RELATED REQUIREMENTS

A. Section 01 11 00 - Summary of Work: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.

B. Section 02 41 00 - Demolition: Selective demolition, site demolition, structure removal.

C. Section 06 10 00 - Rough Carpentry: Lumber, blocking, fasteners for curb extensions.

D. Section 07 51 00 - Build-up Bituminous Roofing.

E. Section 07 90 05 - Joint Sealers.

F. Section 26 05 00 - Basic Electrical Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with demolition and installation of new roof surfacing, modification of roof curbs, and disconnection and reconnection of electrical services to roof mounted equipment.

1.4 CONTRACT DRAWINGS

A. Location and sizes of roof mounted equipment shown on Drawings is approximate. Verify exact locations, distances to other pieces of equipment, sizes, and quantities prior to beginning work. If existing conditions differ slightly, modify work. If measurements or quantities differ substantially, notify Contractor prior to fabrication.

B. Examine site of proposed work and become familiar with job conditions affecting work. No additional allowance will be granted due to lack of information of existing conditions.

1.5 CODES AND INSPECTIONS

A. Comply with applicable codes and standards regarding minimum requirements for materials, methods, and labor practices not otherwise stated in this section.

1.6 ASBESTOS

A. Do not use any material containing asbestos on this project.

B. Provide written confirmation that all materials used in work of this section are asbestos-free.

1.7 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Certificate: Certify that products of this section meet or exceed specified requirements.

C. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.8 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Warranty shall provide repair and replacement of ductwork joint reinforcements and new sheet metal work if the work fails to be water-tight or otherwise fails due to materials or workmanship.

D. Warranty shall include annual inspections during the two-year warranty period.

1.9 TEMPORARY SERVICES

A. Existing multizone unit, cooling coil, refrigerant piping, and compressor are located in a penthouse area that is a return air plenum. All equipment and accessories installed in the penthouse shall be plenum rated.

B. Air quality must not be compromised during times when fan units are in operation and when school is in session. Coordinate work schedule so brazing and other procedures likely to cause odors or otherwise affect air quality are performed during non-school times. Provide temporary exhaust fans, ducts, and filters as required during work that may affect air quality.

1.10 START UP

A. The Mechanical Contractor shall be responsible for proper operation of all systems and shall coordinate start up procedures, calibration and system checkup with subcontractors present. System operational problems shall be diagnosed and corrected as required for system operation.

PART 2 PRODUCTS

2.1 GENERAL

A. Materials and products used in permanent construction shall be new, in appropriate quality, and suitable for work intended purpose.

B. Provide products and materials necessary for temporary operation or relocation during modification and relocation of existing HVAC units.

2.2 PRODUCTS

A. Sealant: MS Polymer Sealant specified in Section 07 90 05.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify work required at each HVAC unit to achieve flashing requirements indicated on Drawings.

3.2 PREPARATION

A. Protection of In-Place Conditions:
   1. Protect existing mechanical equipment, buildings, adjacent roofs materials, and work of other trades.
   2. Provide adequate cover for existing openings exposed by temporary removal of mechanical equipment.

3.3 PERFORMANCE

A. Temporarily disconnect roof or attic mounted equipment required to be removed for installation of products by other trades.

B. Provide temporary connections and by-pass of systems as required for equipment to remain active during the work.

C. Do not damage equipment or work of other trades during disconnection and removal.

D. Coordinate shutdown, disconnection, removal, and replacement of equipment with Owner.

E. Provide as shown on Drawings extended curbs, ductwork, and sheet metal flashing to be extended through new roofing and insulation for roof-mounted exhaust fans, roof ventilators, and other equipment.

F. Reinstall and reconnect equipment. Verify operation of reconnected equipment.

G. Provide hangers, transverse bracing, bolts, and connection types per OSSC and SMACNA Seismic Restraint Manual Guidelines for Mechanical Systems. Provide seismic calculations upon request.

3.4 CLOSEOUT ACTIVITIES

A. See Section 01 77 00 - Closeout Procedures, for closeout submittals.

B. Demonstrate proper operation of equipment to Owner's designated representative.
C. Record Drawings: Provide at completion of work.
D. Operating and Maintenance Manuals: Provide at completion of work.

END OF SECTION

SECTION 23 07 00
MECHANICAL INSULATION

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 SUBMITTALS

A. Provide Shop Drawings for all insulation products to be used on this project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All glass fiber coverings and liners shall have a composite fire and smoke hazard rating as tested by procedure ASTM-E-84, NFPA 255 and UL-723, not exceeding 25 flame spread, 50 smoke developed. All insulation products shall be PBDE free per State of Oregon requirements. All accessories, such as adhesive, mastic cements, tape, and fabric cloths for fitting shall have the same component ratings as listed above. Materials and insulating characteristics shall meet OMSC and OEESC, latest edition.

2.2 PIPE INSULATION

A. Flexible Closed Cell: Flexible, closed cell elastomeric thermal insulation, 1.5 lbs. per cubic foot density with a maximum K factor of 0.25 BTU per inch per square foot per deg. F. per hour at a mean temperature of 75F, non-toxic, non corrosive with maximum 0.05 perm.-in. water vapor transmission. Pre-slit for above ground applications. Heat resistance rating to 250F. Nomaco, Armaflex, or equal.

B. Field Applied Jackets and Fitting Covers: One piece, molded PVC jacket or aluminum jacket 0.016 inch thick.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Prior to all Work of this section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where installation may properly commence.

B. Verify that the Work of this section may be installed in accordance with all pertinent codes and regulations and the approved Shop Drawings.

C. In the event of discrepancy, immediately notify the Architect.

D. Do not proceed with installation in the areas of discrepancy until all such discrepancies have been fully resolved.

3.2 APPLICATION

A. Pipe Insulation:
   1. Refrigeration suction piping: 1-1/2" minimum flexible closed cell.
   2. Refrigeration gas piping inside building: 1-1/2" minimum flexible closed cell.

B. Field Applied Jackets:
   1. Provide aluminum jacket over exterior exposed flexible closed cell insulation.

3.3 INSTALLATION

A. Insulation shall be applied on clean, dry surfaces, after inspection and release for insulation. All insulation shall be continuous through wall and ceiling openings and sleeves. Insulate and cover all fittings, valve bodies, etc., as specified herein.

B. Pipe Insulation: Flexible Closed Cell (above ground) - Insulation shall be slipped on the pipe prior to connection wherever possible, and the radial seams sealed with adhesive. Where the slip-on technique is not possible, pre-slit insulation shall be slit and snapped over the pipe with

longitudinal and radial seams sealed with adhesive. Fitting cover insulation shall be fabricated and installed according to the manufacturer's recommended procedures.

C. Field Applied Jackets: Provide jacket to completely cover exterior exposed insulation. Seal all seams and joints. Install so seams are at the bottom of the piping on horizontal runs.

3.4 CLOSING IN UNINSPECTED WORK

A. Do not cover up or enclose work until it is complete and has passed all required inspections.

B. Should any of the Work be covered up or enclosed prior to all required inspections and approvals, uncover the Work as required; and, after it has been completely inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Architect and at no additional cost to the Owner.

3.5 CLEANING UP

A. Prior to acceptance of the Work, thoroughly clean all exposed portions of the insulation installation, removing all labels and all traces of foreign substance. Remove all debris accumulated by this Work.

END OF SECTION

SECTION 23 23 00
REFRIGERANT SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Replacement of one existing condenser/compressor systems with two new owner-furnished condensing units. Disconnection and reconnection of power and control wiring.

1.2 RELATED REQUIREMENTS

A. Section 01 11 00 - Summary of Work: Owner-Furnished Products.

B. Section 02 41 00 - Demolition: Refrigerant Recovery.

C. Section 07 51 00 -Built-up Bituminous Roofing: Coordination with installation of new roofing.

D. Section 26 05 00 - Basic Electrical Requirements.

1.3 SUBMITTALS

A. Operations and Maintenance Manual: Provide documentation of system components.

B. Owner will furnish contractor with documents for owner-furnished equipment for inclusion in manual. Include startup logs, checklist, and system charge information in manual.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Receive new equipment, in original packaging at 4J Facilities Management, 715 W.4th Ave., Eugene, OR. Deliver to site.

B. Jointly inspect products with Owner's project manager prior to taking possession of equipment.

C. Protect products from damages. Take special care to protect coil fins.

1.6 WARRANTY

A. Submit installer's one-year warranty on installation and contractor-provided components.

PART 2 PRODUCTS

2.1 OWNER-FURNISHED PRODUCTS

A. CU-1A and CU-1B: Two owner-furnished Trane TTA120C400G condensing units.

2.2 ACCESSORIES

A. Provide accessories required for complete installation.

PART 3 EXECUTION

3.1 PROTECTION OF EXISTING SYSTEMS

A. Existing penthouses are return air plenums. Do not compromise quality when fan units are in operation. Fan units shall be in operation during hours when school is in session.

B. Coordinate work schedule so that brazing and other procedures likely to cause odors or otherwise affect air quality are performed during non-school hours.

3.2 PREPARATION - GENERAL

A. Demolish existing equipment. Refer to Section 02 41 00 - Demolition for specific requirements.

3.3 PREPARATION OF EXISTING DX COILS

A. Existing evaporator coils in air handlers are the only part of existing system to be reused. Prior to installing new work, remove piping to coil connections, old TX valve, and other components, and provide means to cap, charge, and test coil. Charge with 200 psi dry nitrogen for 4 days minimum to test integrity of coils. Report results to Owner's project manager.

3.4 REFRIGERANT RECOVERY

A. Recover refrigerant in existing systems in accordance with EPA requirements.

B. Verify that recovery tanks have only been used for R-22. Contamination of removed refrigerant by other refrigerants will disqualify recovered refrigerant for reclaim process.

C. Transport recovered refrigerant to St Vincent DePaul refrigerant recovery/recondition facility at 705 S. Seneca Avenue, Eugene, OR. Have refrigerant analyzed and reconditioned for use in new systems.

D. Recycle excess refrigerant. Existing systems have more capacity than new systems.

E. In the event existing refrigerant is lacking in quantity or quality to fully supply new units, Owner will arrange with St. Vincent DePaul to provide additional new refrigerant as required.

3.5 CONDENSING UNIT INSTALLATION

A. Coordinate installation with roofing installation.

B. Install units on neoprene vibration isolators supplied with unit

C. Install equipment in accordance with manufacturer's instructions following this section.

3.6 REFRIGERATION PIPING/COMPONENT INSTALLATION

A. Install in accordance with manufacturer's installation instruction and these specifications. In the event of conflicts between the documents, notify Owner's project manager for clarification and direction.
   1. Manufacturer's installation document for 10 ton units (model TTA120C400G) is SS-SVX08A-EN. Contact project manager for .pdf versions of this document.

B. Piping shall conform to ASME B31.5 and ASTM B280. Installation to conform to ASME B31.9.

C. Verify TTA models include filter-dryer factory installed within unit. For TTA installation, if liquid line length is less than 80 LF, this filter-dryer within the condensing unit will suffice. If over 80 LF, remove filter dryer within condensing unit and provide new filter-dryer at indoor unit per manufacturer's instructions.

D. Verify TTA units include factory-installed shutoff valves within units at liquid and suction line connections.

E. Route liquid and suction piping together between condenser and indoor unit. Slope 1" per 10ft downhill away from condenser, toward indoor unit. Note that manufacturer's documents indicate a relatively small quantity of suction piping from evaporator outlet(s) to low point of suction piping is sloped away from the coil toward the low point.

F. Route piping as short and direct as possible. Avoid unnecessary changes in direction.

G. Piping and Tubing:
   1. Liquid Lines: 1/2 inch diameter.
   2. Suction Lines: 1-3/8 inch diameter.
   3. Refrigerant Tubing: Sealed Type L.

H. All access ports shall be Schrader valve w/core.

I. Amount of liquid line above TTA condensing unit shall be limited to minimum as required to be routed with suction piping and provide good maintenance access in penthouse. If over 50ft of liquid line will be above condensing unit, notify project manager prior to piping installation. Provide liquid

line components for TTA units, one refrigerant circuit per TTA unit, as follows: Verify factory-installed filter-dryer and service valves per paragraph d. and e. above. If liquid line is greater than 80 LF, remove factory-supplied filter and provide Trane part # DHY01123 filter-dryer with isolation valves and access port at evaporator coil. If liquid line is under 80 LF, provide only access port on liquid line near evaporator. Downstream of access port, provide moisture indicating site glass, and then provide expansion valve. Note that no solenoid valve is required on TTA units. Trane part #s for liquid line components of TTA units are as follows: Sight glass is part # GLS00830 (15 ton) or GLS00853 (10 ton). Expansion valve is part # VAL07076 (10 ton).

J. Provide Trane "Frostat" control, part # KIT01387 on suction line near evaporator outlet.

K. Provide access port on suction line riser, near evaporator coil.

L. Suction line shall have access port at suction line connection to condensing unit (if not already factory-provided), compressor side shutoff valve, and a suction filter with built-in access port and isolation valve on inlet side.

M. Consult Trane or RSD for appropriate filter shell and core for 10 ton TTA unit. Filter cores for TTA units shall only be in place for first three months of operation. After 3 months, contractor shall remove TTA unit filter cores, and check and make any adjustments to system charge as required.

N. Insulate the gas line, and neatly tape seams with black high-adhesive "Gorilla" brand tape or approved.

3.7 STARTUP

A. Arrange for and pay for startup services from certified Trane start-up technician.

3.8 CLOSEOUT

A. Provide operation and maintenance manual with documentation of system components. Include the following:
   1. Owner-provided documents for owner-furnished equipment.
   2. Startup logs, checklist, and system charge information.

3.9 CLEANING

A. Remove all waste material and leave equipment in clean condition.

3.10 PROTECTION

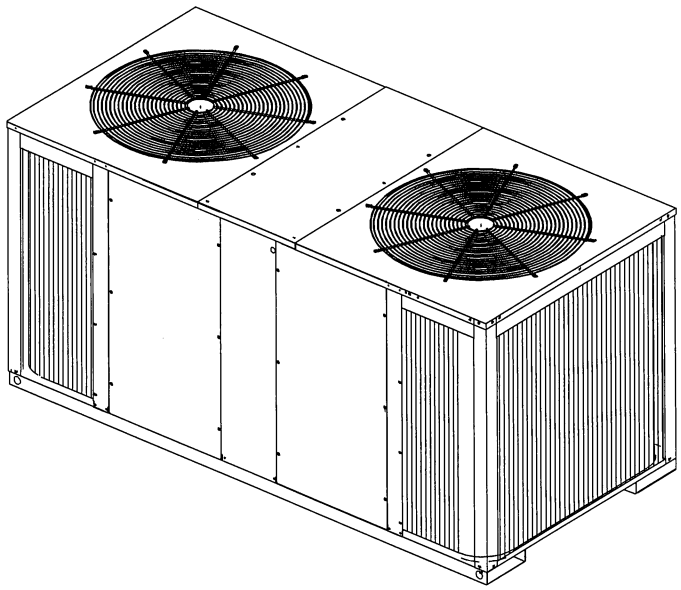
A. Protect installed equipment from construction operations.

END OF SECTION

Installation Operation Maintenance

Split Systems Cooling Condensers

7½ - 20 Tons



Model Numbers

TTA090A***F (60 Hz)
TTA120A***F (60 Hz)
TTA120B***F (60 Hz)
TTA120C***G (60 Hz)
TTA150B***F (60 Hz)
TTA180B***F (60 Hz)
TTA180C***G (60 Hz)
TTA240B***F (60 Hz)
TTA075AD**F (50 Hz)
TTA085AD**F (50 Hz)
TTA100AD**F (50 Hz)
TTA100BD**F (50 Hz)
TTA100CD**G (50 Hz)
TTA125BD**F (50 Hz)
TTA155BD**F (50 Hz)
TTA155CD**G (50 Hz)
TTA200BD**F (50 Hz)

January 2009

SS-SVX08A-EN

Warnings, Cautions and Notices

Warnings, Cautions and Notices. Note that warnings, cautions and notices appear at appropriate intervals throughout this manual. Warnings are provide to alert installing contractors to potential hazards that could result in personal injury or death. Cautions are designed to alert personnel to hazardous situations that could result in personal injury, while notices indicate a situation that could result in equipment or property-damage-only accidents.

Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

ATTENTION: Warnings, Cautions and Notices appear at appropriate sections throughout this literature. Read these carefully.

⚠ **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE: Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns!

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs such as HCFCs and HFCs.

Responsible Refrigerant Practices!

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠WARNING Contains Refrigerant!

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

Important: *DO NOT release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state, and local laws.*

Important: *One copy of this document ships inside the control panel of each unit and is customer property. It must be retained by the unit's maintenance personnel.*

This booklet describes proper installation, operation, and maintenance procedures for air cooled systems. By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized.

It is important that periodic maintenance be performed to help assure trouble free operation. A maintenance schedule is provided at the end of this manual. Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

Important: *All phases of this installation must comply with the NATIONAL, STATE & LOCAL CODES. In addition to local codes, the installation must conform with National Electric Code -ANSI/NFPA NO. 70 LATEST REVISION.*

Any individual installing, maintaining, or servicing this equipment must be properly trainied licensed and qualified.

Table of Contents

Model Number Description

TTA	090	A	3	00	A	A
1 2 3	4 5 6	7	8	9 10	11	12

Model Number Description

All products are identified by a multiple-character model number that precisely identifies a particular type of unit. An explanation of the alphanumeric identification code is provided. Its use will enable the owner/operator, installing contractors, and service engineers to define the operation, specific components, and other options for any specific unit.

When ordering replacement parts or requesting service, be sure to refer to the specific model number, serial number, and DL number (if applicable) stamped on the unit nameplate.

DIGITS 1-3: PRODUCT TYPE

TTA = Split System Cooling

DIGITS 4-6: NOMINAL GROSS COOLING CAPACITY (MBh)

090 = 90 MBh
120 = 120 MBh
150 = 150 MBh
180 = 180 MBh
240 = 240 MBh

DIGIT 7: MAJOR DEVELOPMENT SEQUENCE

A = 1 Refrigerant Circuit
B = 2 Refrigerant Circuit
C = Manifold Scroll Compressors

DIGIT 8: ELECTRICAL CHARACTERISTICS

3 = 208-230/60/3
4 = 460/60/3
W = 575/60/3
D = 380-415/50/3
K = 380/60/3

DIGITS 9, 10: FACTORY INSTALLED OPTIONS

00 = Packed Stock
0S = Black Epoxy Coated Coil
0R = ReliaTel™, no LCI Board
0T = ReliaTel™, no LCI Board with Black Epoxy Coated Coil
0U = ReliaTel™, with LCI Board
0W = ReliaTel™, with LCI Board and Black Epoxy Coated Coil

DIGITS 11: MINOR DESIGN SEQUENCE

A = Current Design Sequence

DIGITS 12: SERVICE DIGIT

A = Current Service Digit

General Information

Installation procedures should be performed in the sequence that they appear in this manual. Do not destroy or remove the manual from the unit.

The manual should remain weather-protected with the unit until all installation procedures are complete.

Note: *It is not the intention of this manual to cover all possible variations in systems that may occur or to provide comprehensive information concerning every possible contingency that may be encountered during an installation. If additional information is required or if specific problems arise that are not fully discussed in this manual, contact your local sales office.*

Installation Checklist

An "Installation Checklist" is provided at the end of the installation section of this manual. Use the checklist to verify that all necessary installation procedures have been completed. Do not use the checklist as a substitute for reading the information contained in the manual. Read the entire manual before beginning installation procedures.

Unit Inspection

Inspect material carefully for any shipping damage. If damaged, it must be reported to, and claims made against the transportation company. Compare the information that appears on the unit nameplate with ordering and submittal data to ensure the proper unit was shipped. Available power supply must be compatible with electrical characteristics specified on component nameplates. Replace damaged parts with authorized parts only.

Inspection Checklist

To protect against loss due to damage incurred in transit, complete the following checklist upon receipt of the unit.

1. Inspect individual pieces of the shipment before accepting the unit. Check for obvious damage to the unit or packing material.
2. Inspect the unit for concealed damage before it is stored and as soon as possible after delivery. Concealed damage must be reported within 15 days. If concealed damage is discovered, stop unpacking the shipment. Do not remove damaged material from the receiving location. Take photos of the damage if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
3. Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
4. Notify the sales representative and arrange for repair. Do not repair the unit until the damage is inspected by the carrier's representative.

Initial Leak Test

All **TTA** units are shipped with a holding charge of nitrogen in each circuit. Remove the compressor access panel(s) shown in Figure 2, p. 11. Locate the liquid line or suction line service valve for each circuit. Install gauges to determine if the circuits are still pressurized. If not, the charge has escaped. Repair as required to obtain a leak-free circuit.

Lifting Recommendations

⚠ WARNING
Improper Unit Lift!

Test lift unit approximately 24 inches to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level. Failure to properly lift unit could result in unit dropping which could result in death or serious injury and possible equipment or property-only damage.

Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed. Approximate unit weights are given in Table 1.

Table 1. Total Unit Weight and Corner Weights (lbs)

Model	Ship Max.	Net Max.	Corner Weights #1	#2	#3	#4
TTA090A TTA075A	370	326	105	83	61	77
TTA085A TTA120A TTA100A	443	399	149	116	78	100
TTA120B TTA100B	481	427	133	135	87	85
TTA120C TTA100C	492	437	133	122	87	95
TTA150B TTA125B	481	427	133	135	87	85
TTA180B TTA155B	764	679	196	193	144	146
TTA180C TTA155C	764	679	196	193	144	146
TTA240B TTA200B	915	830	247	247	168	168

The crated unit can be moved using a forklift of suitable capacity. For lifting the unit, attach lifting straps or slings securely to the lifting holes at each corner. Use spreader bars to protect the unit casing from damage. Test lift the unit to determine proper balance and stability.

NOTICE

Equipment Damage!

Use spreader bars to prevent lifting straps from damaging the unit. Install bars between lifting straps. This will prevent the straps from crushing the unit cabinet or damaging the unit finish.

Pre-Installation

Clearances

Provide enough space around the unit to allow unrestricted access to all service points. Refer to Figure 1 through Figure 8, p. 15 for unit dimensions and minimum required service and free air clearances. Observe the following points to ensure proper unit operation.

1. Do not install the unit under a low overhang. Condenser discharge must not be restricted. See Notes in Figure 1 through Figure 8.

Important: *Do not obstruct condenser discharge air. This can result in warm air recirculation through the coil.*

2. Do not locate the unit in a position where runoff water can fall into the fan discharge openings.
3. Condenser intake air is supplied from three sides of the unit. Adhere to the minimum required clearances given in Figure 1 through Figure 8.

Unit Mounting

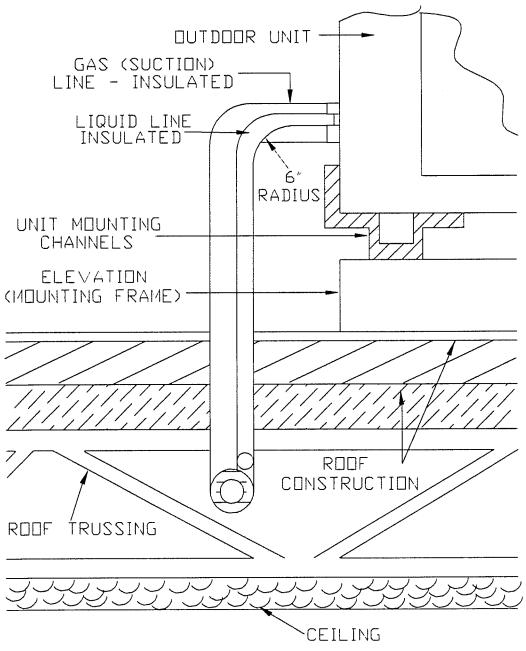
⚠ WARNING
Mounting Integrity!

Ensure that the roof structure supports are strong enough to support the weight of the unit and any accessories. Failure to do so could result in death or serious injury or possible equipment or property-only damage.

Rooftop Mounting

If the unit will be roof mounted, determine for certain that the structure is strong enough to support the unit and any required accessories. Unit weights are given in Table 1, p. 8. The unit should be elevated on a level, field fabricated four-inch steel or wood 4" x 4" mounting frame. Complete the frame and secure it into position before lifting the unit to the roof. The mounting frame must support a minimum of three of the unit's four sides and should span roof supports to distribute the load on the roof.

Figure 1. Roof Mounted Unit



Ground Level Mounting

For ground level installation, the unit base should be adequately supported and hold the unit near level. The installation must meet the guidelines set forth in local codes. The support should extend two inches beyond the unit base channels at all points. The unit and support must be isolated from any adjacent structure to prevent possible noise or vibration problems. Any ground level location must comply with required clearances given in Figure 1, p. 9 through Figure 8, p. 15.

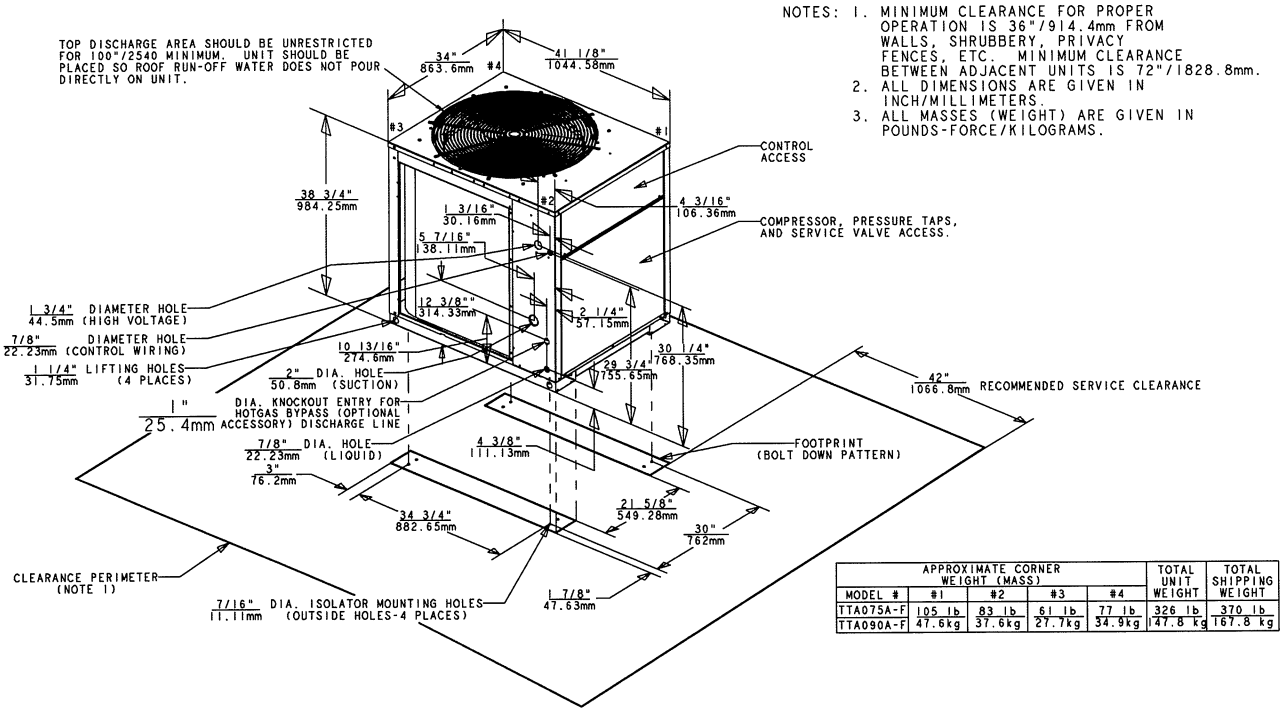
Refrigerant Piping

Structural Preparation

Holes must be made in the structure to run refrigerant lines. For the majority of ground-level installations, the holes can be made in the header that rests on top of the foundation. Alternatively, these holes may also be made in the foundation itself. On roof-mounted units, refrigerant lines should enter the building as close to the unit as possible; preferably within three to four inches of the refrigerant connection on the unit, plus a 6-inch (long radius) 90° ell entering the building, Figure 1. See Figure 2 through Figure 8 for unit dimensions and minimum clearances.

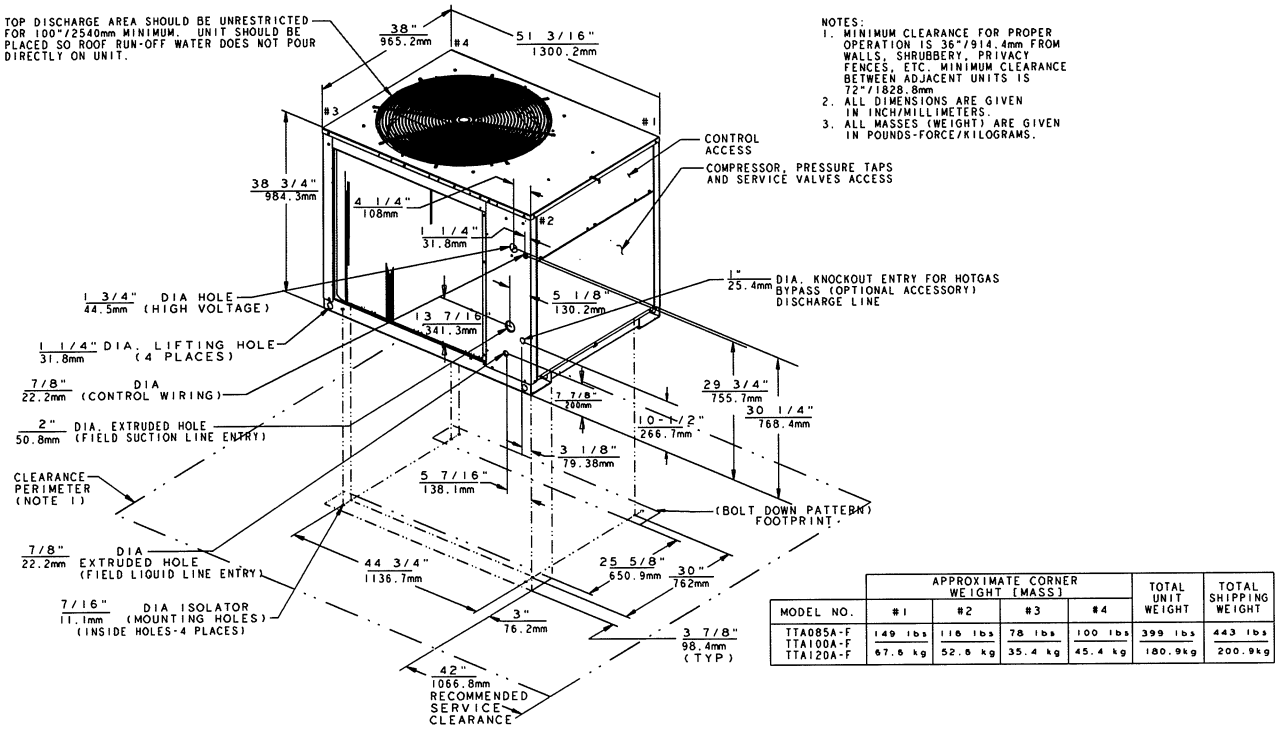
Dimensional Data

Figure 2. TTA075A, TTA090A, Dimensional Data, Connection Location, Clearances, Corner Weights



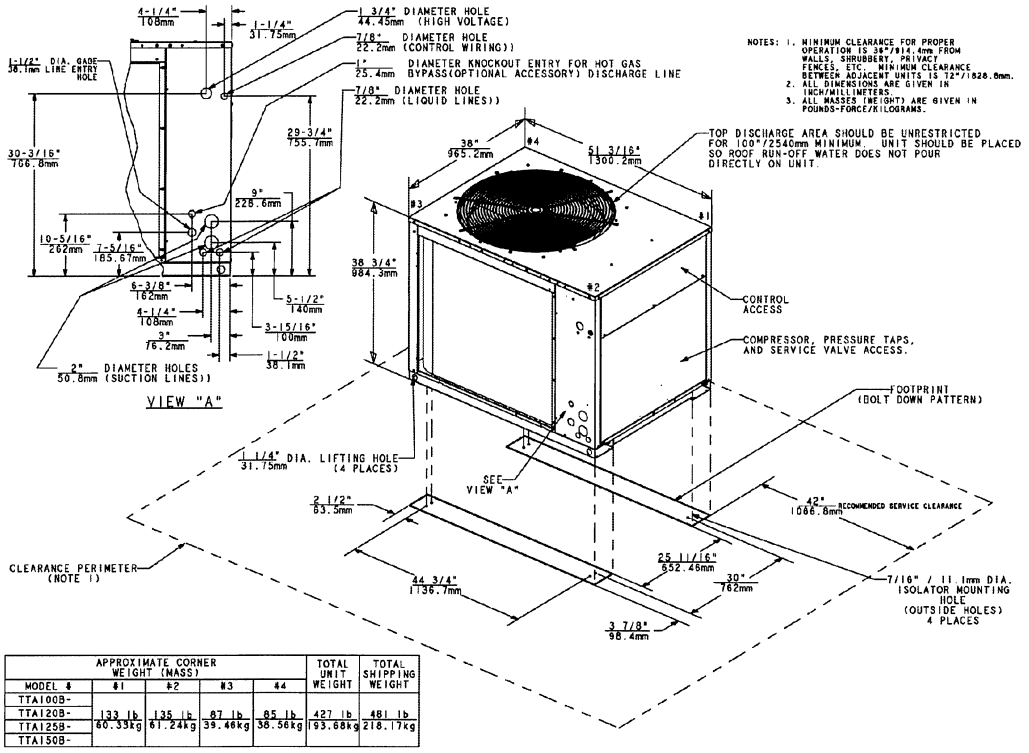
MODEL #	APPROXIMATE CORNER WEIGHT (MASS) #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA075A-F	105 lb	83 lb	61 lb	77 lb	326 lb	370 lb
TTA090A-F	47.6kg	37.6kg	27.7kg	34.9kg	147.8 kg	167.8 kg

Figure 3. TTA085A, TTA100A, TTA120A, Dimensional Data, Connection Location, Clearances, Corner Weights



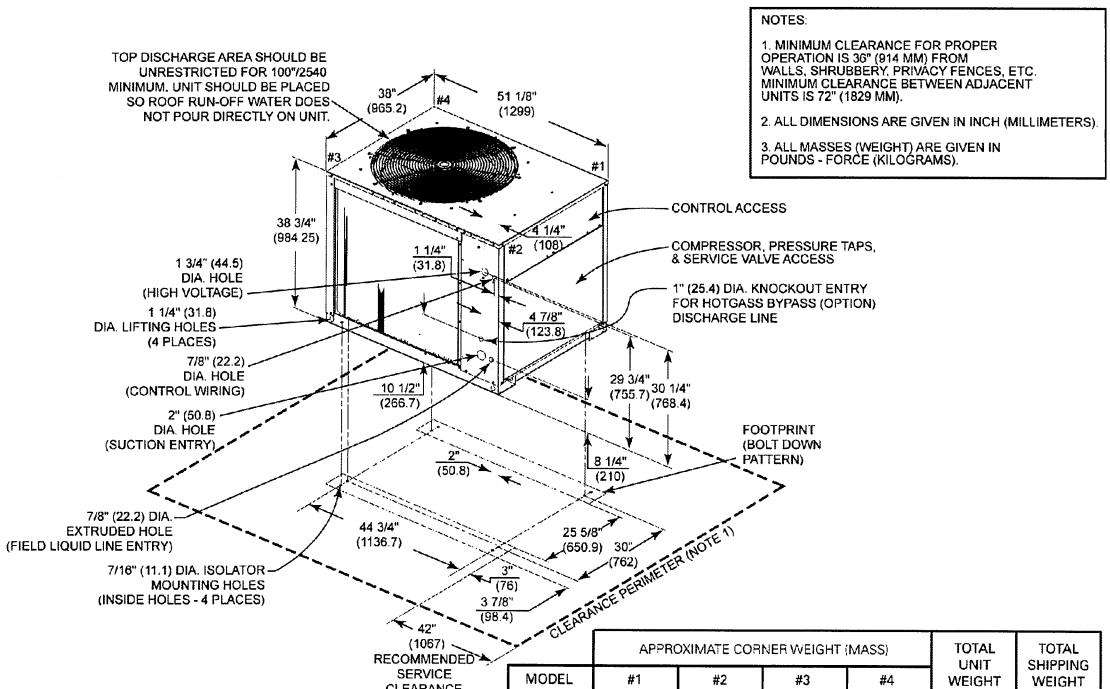
MODEL NO.	APPROXIMATE CORNER WEIGHT (MASS) #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA085A-F	149 lbs	118 lbs	78 lbs	100 lbs	399 lbs	443 lbs
TTA100A-F	67.6 kg	52.6 kg	35.4 kg	45.4 kg	180.9kg	200.9kg
TTA120A-F						

Figure 4. TTA100B, TTA120B, TTA125B, TTA150B, Dimensional Data, Connection Location, Clearances, Corner Weights



MODEL #	APPROXIMATE CORNER WEIGHT (MASS) #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA100B-						
TTA120B-	133 lb 60.33kg	135 lb 61.24kg	87 lb 39.46kg	85 lb 38.56kg	427 lb 193.68kg	481 lb 218.17kg
TTA125B-						
TTA150B-						

Figure 5. TTA100C, TTA120C, Dimensional Data, Connection Location, Clearances, Corner Weights



MODEL	APPROXIMATE CORNER WEIGHT (MASS) #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA100C-G	133 LB 60.3 KG	122 LB 55.3 KG	87 LB 39.5 KG	95 LB 43.1 KG	437 LB 198.2 KG	492 LB 223.2 KG
TTA120C-G						

Figure 6. TTA155B, TTA180B, Dimensional Data, Connection Location, Clearances, Corner Weights

MODEL NO.	APPROXIMATE CORNER WEIGHT (MASS) #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA155BD-F	196 lbs	193 lbs	144 lbs	146 lbs	679 lbs	764 lbs
TTA180B -F	88.9 kg	87.5 kg	65.3 kg	66.2 kg	308 kg	354.2 kg

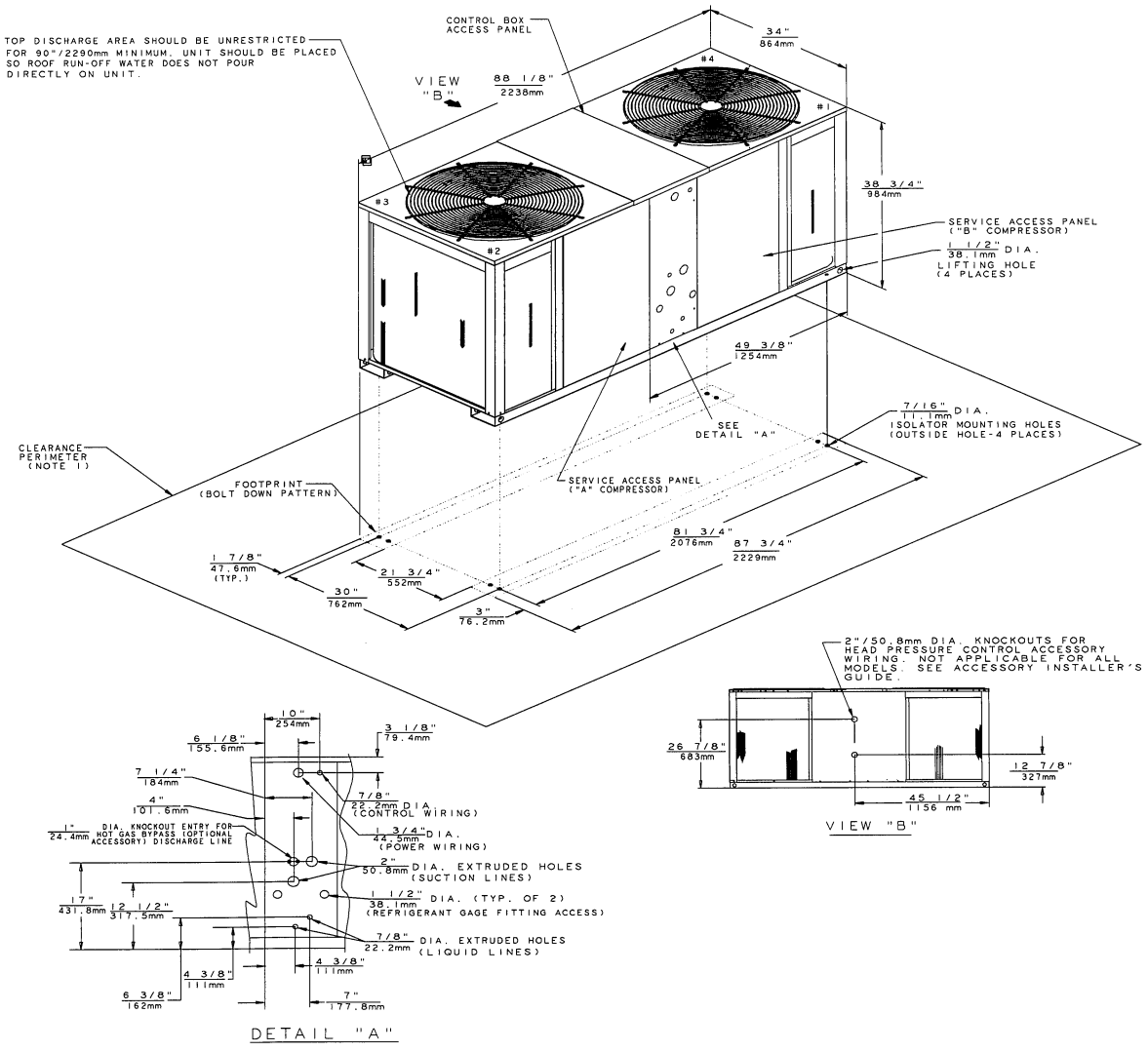


Figure 7. TTA155C, TTA180C, Dimensional Data, Connection Location, Clearances, Corner Weights

MODEL	APPROXIMATE CORNER WEIGHT [MASS] #1	#2	#3	#4	TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
TTA155C-G	196 lb	193 lb	144 lb	146 lb	679 lb	764 lb
TTA180C-G	88.9 kg	87.5 kg	65.3 kg	66.2 kg	308 kg	354.2kg

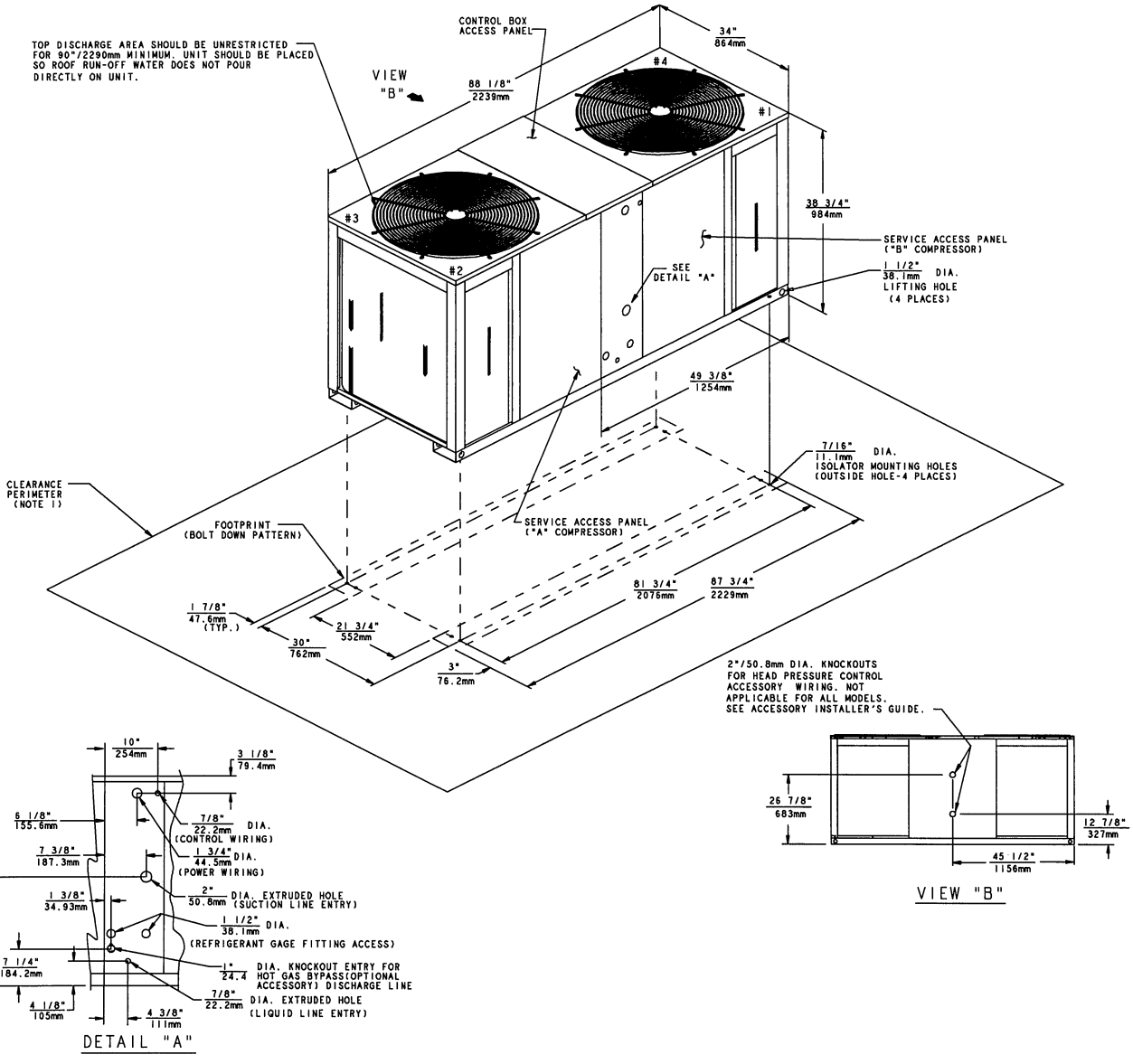
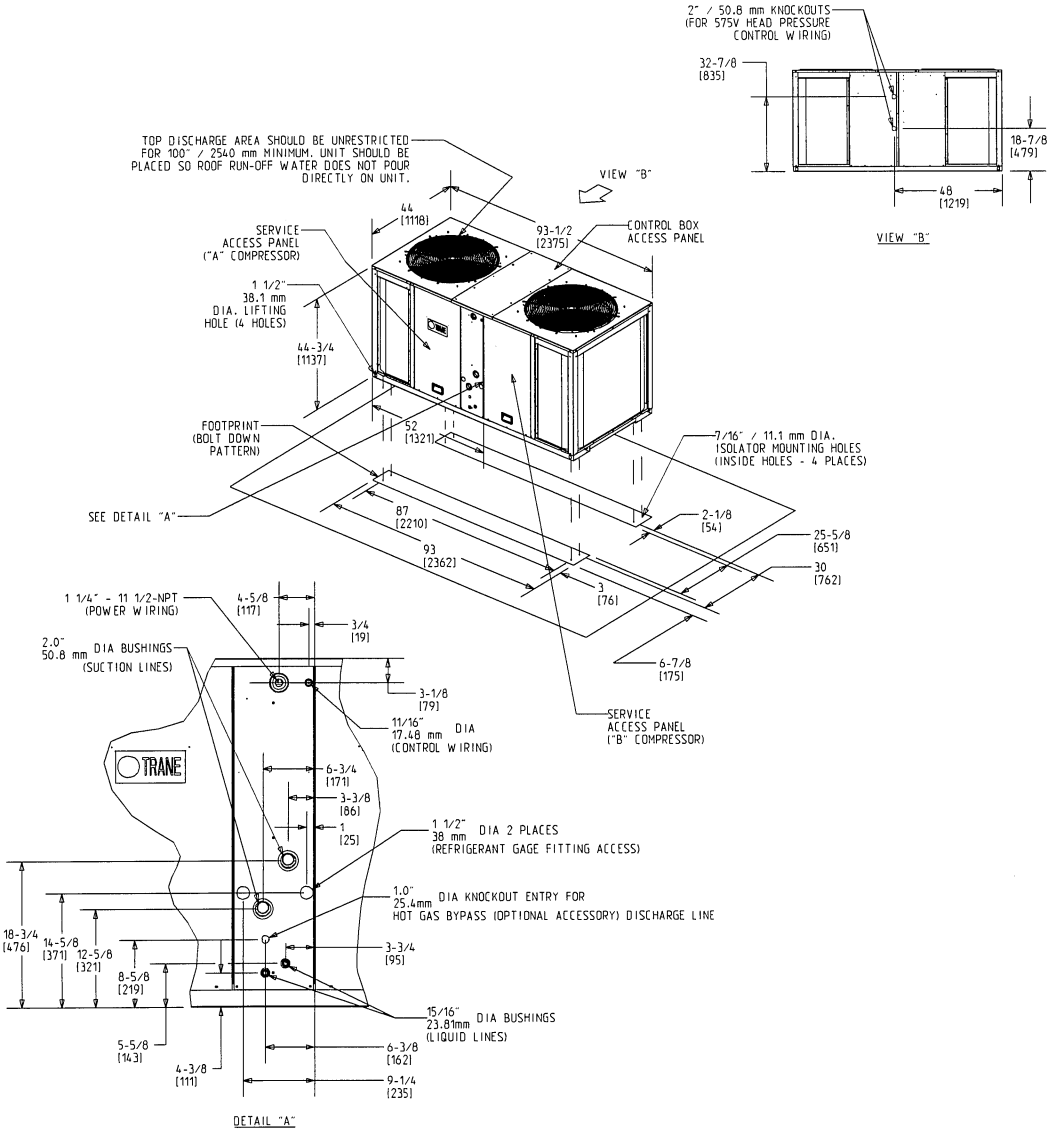


Figure 8. TTA200B, TTA240B, Dimensional Data, Connection Location, Clearances, Corner Weights

APPROXIMATE CORNER WEIGHT (MASS)					TOTAL UNIT WEIGHT	TOTAL SHIPPING WEIGHT
MODEL NO.	#1	#2	#3	#4		
TTA240B	247 lbs 112 kg	247 lbs 112 kg	168 lbs 76.2 kg	168 lbs 76.2kg	830 lbs 376.5 kg	915 lbs 415 kg

NOTES:

1. MINIMUM CLEARANCE FOR PROPER OPERATION IS 36" / 914 mm FROM WALLS, SHRUBBERY, PRIVACY FENCES, ETC. MINIMUM CLEARANCE BETWEEN ADJACENT UNITS IS 72" / 1830 mm.
2. ALL DIMENSIONS ARE GIVEN IN INCH / MILLIMETERS.
3. ALL MASSES (WEIGHTS) ARE GIVEN IN POUNDS-FORCE / KILOGRAMS.



Electrical Data

Table 2. TTA Unit Electrical Data — 60 Hz

Model Number	Basic Unit Characteristics				Compressor Motor			Outdoor Fan Motor			
						Amps				Amps	
	Electrical Characteristics	Allowable Voltage Range	Minimum Circuit Ampacity	Maximum Fuse Size	Qty.	RLA	LRA	Qty.	HP	FLA	LRA
TTA090A3	208-230/60/3	187-253	34.5	50	1	25.1	182.0	1	1/2	3.1	8.1
TTA090A4	460/60/3	414-506	18.1	25	1	13.2	94.9	1	1/2	1.6	3.7
TTA090AK	380/60/3	342-418	21.0	30	1	15.0	106.3	1	1	2.2	5.8
TTA090AW	575/60/3	518-632	14.5	20	1	10.6	70.0	1	1/2	1.2	3.0
TTA120A3	208-230/60/3	187-253	48.1	70	1	33.7	278.0	1	1	6.0	17.0
TTA120A4	460/60/3	414-506	23.3	35	1	16.5	124.0	1	1	2.7	7.0
TTA120AK	380/60/3	342-418	26.0	40	1	18.1	137.0	1	1	3.4	7.8
TTA120AW	575/60/3	518-632	18.8	25	1	13.4	92.0	1	1	2.0	5.7
TTA120B3	208-230/60/3	187-253	47.9	60	2	18.6	128.0	1	1	6.0	17.0
TTA120B4	460/60/3	414-506	23.9	30	2	9.4	63.0	1	1	2.7	7.0
TTA120BK	380/60/3	342-418	27.5	35	2	10.7	64.0	1	1	3.4	7.8
TTA120BW	575/60/3	518-632	19.1	25	2	7.6	49.0	1	1	2.0	5.7
TTA150B3	208-230/60/3	187-253	55.5	70	2	22.0	156.0	1	1	6.0	17.0
TTA150B4	460/60/3	414-506	25.2	35	2	10.0	70.0	1	1	2.7	7.0
TTA150BK	380/60/3	342-418	27.5	35	2	10.7	70.0	1	1	3.4	7.8
TTA150BW	575/60/3	518-632	20.5	25	2	8.2	54.0	1	1	2.0	5.7
TTA180B3	208-230/60/3	187-253	62.7	80	2	25.1	182.0	2	1/2	3.1	8.1
TTA180B4	460/60/3	414-506	32.9	45	2	13.2	94.9	2	1/2	1.6	3.7
TTA180BK	380/60/3	342-418	38.2	50	2	15.0	106.3	2	1	2.2	5.8
TTA180BW	575/60/3	518-632	26.3	35	2	10.6	70.0	2	1/2	1.2	3.0
TTA240B3	208-230/60/3	187-253	87.8	100	2	33.7	278.0	2	1	6.0	17.0
TTA240B4	460/60/3	414-506	42.5	50	2	16.5	124.0	2	1	2.7	7.0
TTA240BK	380/60/3	342-418	47.5	60	2	18.1	137.0	2	1	3.7	7.8
TTA240BW	575/60/3	518-632	34.2	45	2	13.4	92.0	2	1	2.0	5.7
TTA120C3	208-230/60/3	187-253	49.4	60	2	17.7	123.0	1	1	6.0	17.0
TTA120C4	460/60/3	414-506	25.2	30	2	9.0	62.0	1	1	2.7	7.0
TTA120CW	575/60/3	518-632	19.8	25	2	7.9	50.0	1	1	2.0	5.7
TTA180C3	208-230/60/3	187-253	62.7	80	2	25.1	182.0	2	1/2	3.1	8.1
TTA180C4	460/60/3	414-506	32.9	45	2	13.2	94.9	2	1/2	1.6	3.8
TTA180CW	575/60/3	518-632	26.3	35	2	10.6	70.0	2	1/2	1.2	3.0

Table 3. TTA Unit Electrical Data — 50 Hz

Model Number	Basic Unit Characteristics				Compressor Motor			Outdoor Fan Motor			
						Amps				Amps	
	Electrical Characteristics	Allowable Voltage Range	Minimum Circuit Ampacity	Maximum Fuse Size	Qty.	RLA	LRA	Qty.	HP	FLA	LRA
TTA075AD	380-415/50/3	380-415	15.6	25	1	11.2	94.9	1	1/2	1.6	4.0
TTA085AD	380-415/50/3	380-415	19.1	25	1	13.1	100.0	1	1	2.7	9.3
TTA100AD	380-415/50/3	380-415	22.5	35	1	15.8	124.0	1	1	2.7	9.3
TTA100BD	380-415/50/3	380-415	23.9	30	2	9.4	63.0	1	1	2.7	9.3
TTA125BD	380-415/50/3	380-415	25.2	35	2	10.0	70.0	1	1	2.7	9.3
TTA155BD	380-415/50/3	380-415	28.4	35	2	11.2	94.9	2	1/2	1.6	4.0
TTA200BD	380-415/50/3	380-415	41.0	50	2	15.8	124.0	2	1	2.7	9.3
TTA120CD	380-415/50/3	380-415	24.4	30	2	10.0	58.0	1	1	1.9	5.8
TTA155CD	380-415/50/3	380-415	28.4	35	2	11.2	94.9	2	1/2	1.6	4.0

Installation

Refrigerant Piping Guidelines

Figure 9. Allowable elevation difference: Cooling only TTA *above* indoor unit

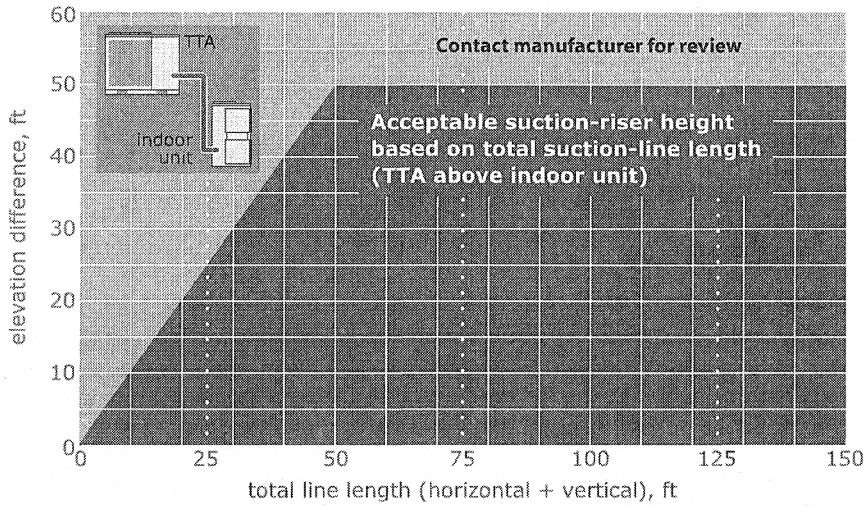
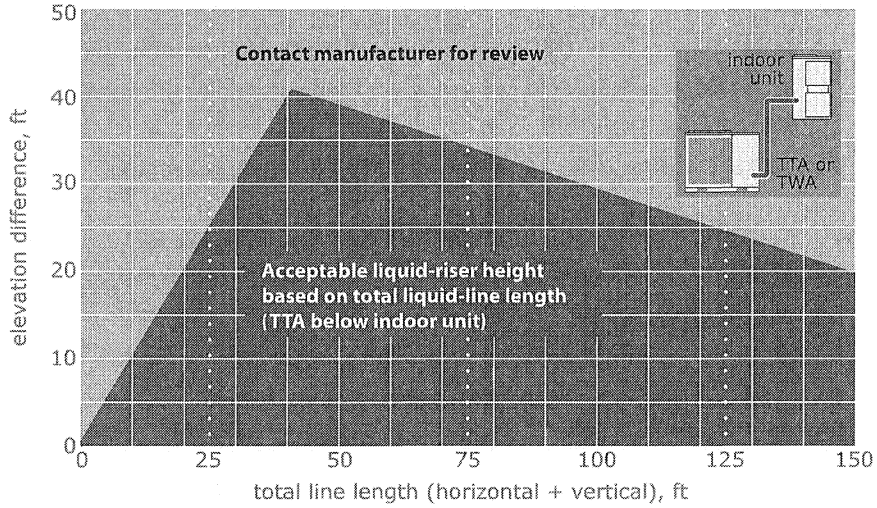


Figure 10. Allowable elevation difference: TTA *below* indoor unit



1. Recommended allowable pressure drops (R-22):

Suction Line..... 6 psi

Liquid Line ..... 35 psi (w/o subcooler)

Note: *Route refrigerant piping for minimum linear length, minimum number of bends and fittings (no reducers) and minimum amount of line exposed to outdoor ambients.*

2. Recommended line sizes TTA075, 085, 090, 100 and 120A, TTA155B, 180, 200, 240B , and TTA100 and 120C:

Suction Line..... 1 3/8" sealed type L refrigerant tubing

Liquid Line..... 1/2" sealed type L refrigerant tubing

3. Recommended line sizes TTA100, TTA120B, TTA125B, TTA150B

Suction Line..... 1 1/8" sealed type L refrigerant tubing
Liquid Line..... 3/8" sealed type L refrigerant tubing

4. Recommended line sizes TTA155 and 180C

Suction Line..... 1 5/8" sealed type L refrigerant tubing
Liquid Line..... 5/8" sealed type L refrigerant tubing

Note: *Insulate all refrigerant piping and connections.*

Refrigerant Piping Procedures (Outdoor Units)

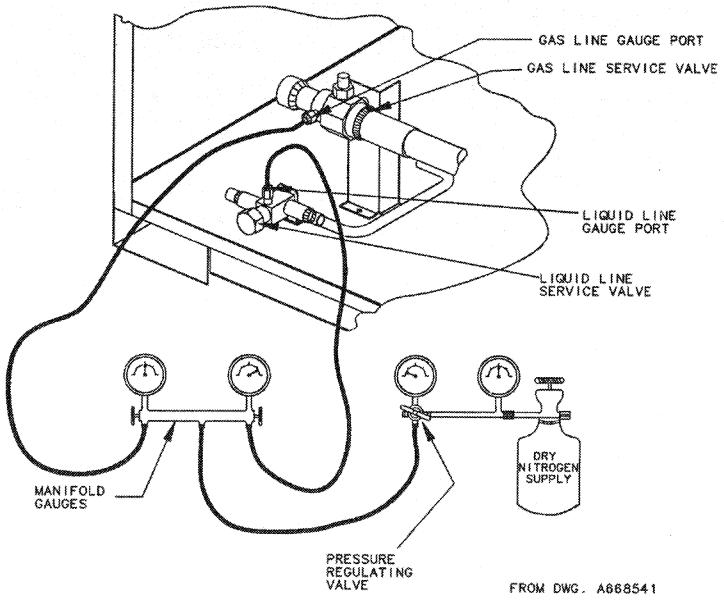
⚠ WARNING
Flammable Vapors!

When connecting to existing gas lines be sure to shut off the gas supply ahead of connection point. To avoid explosion or possible fire, always purge all residual gas from piping before cutting into existing line or removing threaded fittings. Failure to shut off the gas supply and remove all gas vapors could result in death or serious injury.

Each TTA unit ships with a holding charge of dry nitrogen. The nitrogen should be removed and the entire system evacuated (at the proper time) to avoid possible contamination.

1. Remove the compressor service access panel.
2. Locate the liquid and suction line service valves. Check that the piping connection stubs on the valves (Figure 3, p. 11) line up properly with the holes in the unit cabinet.
3. Remove the refrigerant connection seal caps and open the service valve slowly to release the nitrogen from the unit.

Figure 11. Outdoor Units - Refrigerant Piping (with dry nitrogen)



⚠ WARNING

Hazard of Explosion and Deadly Gases!

Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids. Failure to follow all proper safe refrigerant handling practices could result in death or serious injury.

NOTICE

System Component Damage!

Do not remove the seal caps from refrigerant connections, or open the service valves until prepared to braze refrigerant lines to the connections. Excessive exposure to atmosphere (> 5 min.) may allow moisture or dirt to contaminate the system, damaging valve seals and causing ice formation in system components.

4. Cut, fit and braze tubing, starting at the outdoor unit and work toward the indoor unit.

Note: *Use long radius ells for all 90° bends.*

All brazing should be done using a 2 to 8 psig dry nitrogen purge flowing through the pipe being brazed, Figure 11, p. 18.

NOTICE

System Component Damage!

Install a regulating valve between the nitrogen source and the gauge manifold (Figure 11). Unregulated pressure can damage system components.

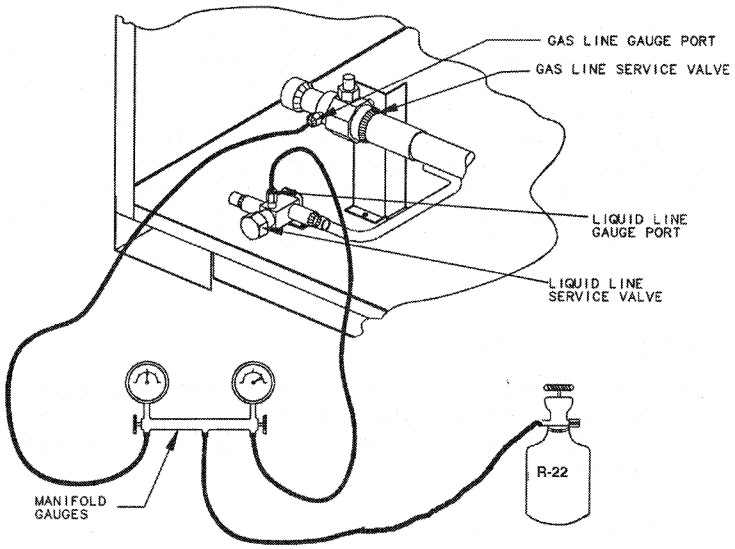
NOTICE

System Component Damage!

Wet-wrap all valves and protect painted surfaces from excessive heat. Heat can damage system components and the unit finish.

5. Shut off nitrogen supply. Shut off the manifold valve for the line that is connected to the suction line service valve. Disconnect the line from the gauge port on the valve.

Figure 12. Outdoor Units - Refrigerant Piping (w/ R-22)



Refrigerant Piping Procedure (Indoor Unit)

Once liquid and suction lines are complete to the refrigerant connections on the indoor unit, puncture the seal caps on the indoor unit connection stubs to release the dry nitrogen charge.

NOTICE
Unit Damage!

Do not apply heat to remove seal caps until they have been punctured. If seal caps are intact, application of heat may generate excessive pressure in the unit and result in damage to the coil or expansion valve.

1. Remove both seal caps from the indoor unit connection stubs.

NOTICE
Equipment Damage!

Do not remove the seal caps from refrigerant connections, or open the service valves until prepared to braze refrigerant lines to the connections. Excessive exposure to atmosphere (> 5 min.) may allow moisture or dirt to contaminate the system, damaging valve seals and causing ice formation in system components.

2. Turn nitrogen supply on. Nitrogen enters thorough liquid line gauge port.
3. Braze the liquid line connections.

⚠ WARNING
Hazard of Explosion and Deadly Gases!

Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids. Failure to follow all proper safe refrigerant handling practices could result in death or serious injury.

4. Open the gauge port on the suction line and then braze the suction line to the connection stub. Nitrogen will bleed out the open gauge port on the suction line.
5. Shut off nitrogen supply.

Leak Check

⚠ WARNING
Hazard of Explosion!

Never use an open flame to detect gas leaks. Explosive conditions may occur. Use a leak test solution or other approved methods for leak testing. Failure to follow recommended safe leak test procedures could result in death or serious injury or equipment or property-only-damage.

⚠ WARNING
Hazardous Pressures!

When using dry nitrogen cylinders for pressurizing units for leak testing, always provide a pressure regulator on the cylinder to prevent excessively high unit pressures. Never pressurize unit above the maximum recommended unit test pressure as specified in applicable unit literature. Failure to properly regulate pressure could result in a violent explosion, which could result in death or serious injury or equipment or property-only-damage.

After the brazing operation of refrigerant lines to both the outdoor and indoor unit is completed, the field brazed connections must be checked for leaks. Pressurize the system through the service valve with dry nitrogen to 200 psi. Use soap bubbles or other leak-checking methods to ensure that all field joints are leak free. If not, release pressure, repair and repeat leak test.

System Evacuation

1. After completion of leak check, evacuate the system.
2. Attach appropriate hoses from manifold gauge to gas and liquid line pressure taps.

Note: *Unnecessary switching of hoses can be avoided and complete evacuation of all lines leading to sealed system can be accomplished with manifold center hose and connecting branch hose to a cylinder of R-22 and vacuum pump.*

3. Attach center hose of manifold gauges to vacuum pump.
4. Evacuate the system to hold a 350 micron vacuum.
5. Close off valve to vacuum pump and observe the micron gauge. If gauge pressure rises above 500 microns in one (1) minute, then evacuation is incomplete or the system has a leak.
6. If vacuum gauge does not rise above 500 microns in one (1) minute, the evacuation should be complete.
7. With vacuum pump and micron gauge blanked off, open valve on R-22 cylinder and allow refrigerant pressure to build up to about 40 psig.

8. Close valve on the R-22 supply cylinder. Close valves on manifold gauge set and remove refrigerant charging hoses from liquid and gas gauge ports.
9. Leak test the entire system. Using proper procedures and caution, repair any leaks found and repeat the leak test.

Refrigerant Charging Procedure

If charging by weight, refer to refrigerant charges that are given in Table 4. If additional refrigerant is needed because of length of line, calculate the requirement using Table 5, p. 23.

Charge by weight through the gauge port on the liquid line. Once the charge enters the system, backseat (open) the liquid line service valve and disconnect the charging line and replace the cap on the gauge port.

Insulating and Isolating Refrigerant Lines

Insulate the entire suction line with refrigerant piping insulation. Also insulate any portion of the liquid line exposed to temperature extremes. Insulate and isolate liquid and suction lines from each other. Isolate refrigerant lines from the structure and any duct work.

Note: *To prevent possible noise or vibration problems, be certain to isolate refrigerant lines from the building.*

Table 4. TTA Refrigerant Charge (R-22)

Model	Refrigerant Charge
TTA090A TTA075A	16 lbs 0.0 ozs
TTA085A TTA120A TTA100A	19 lbs 0.0 ozs
TTA120B TTA100B	10 lbs 8.0 ozs (ea. Ckt.)
TTA150B TTA125B	11 lbs13.0 ozs (ea. Ckt.)
TTA180B TTA155B	15 lbs 0.0 ozs (ea. Ckt.)
TTA240B TTA200B	18 lbs 0.0 ozs (ea. Ckt.)
TTA120C TTA100C	20 lbs 8.0 ozs
TTA180C TTA155C	28 lbs 0.0 ozs

Note: *Sufficient operating charge for outdoor unit and 25 feet of nominally sized refrigerant piping.

Table 5. Additional Required Refrigerant

Tubing Sizes		Additional Tubing Length	Additional Refrigerant
Suction	Liquid		
1 1/8	"3/8	"15 ft.	0 lb, 11.5 oz[a]
		25 ft.	1 lb,3.0 oz[a]
		32 ft.	1 lb, 8.0 oz[a]
		40 ft.	1 lb, 14.0 oz[a]
1 3/8	"1/2	"15 ft.	1 lb, 4.0 oz[b]
		25 ft.	2 lb, 1.0 oz[b]
		32 ft.	2 lb, 11.0 oz[b]
		40 ft.	3 lb, 1.0 oz[b]
1 5/8	"5/8	"15 ft.	1 lb, 15.0 oz[c]
		25 ft.	3 lb, 4.5 oz[c]
		32 ft.	4 lb, 3.2 oz[c]
		40 ft.	5 lb, 4.0 oz[c]

(a) Amounts shown are based on .75 ounces of refrigerant per foot of 1 1/8" and 3/8" lines.
(b) Amounts shown are based on 1.33 ounces of refrigerant per foot of 1 3/8" and 1/2" lines.
(c) Amounts shown are based on 2.1 ounces of refrigerant per foot of 1 5/8" and 5/8" lines.

Note: *For tubing over 40 ft. calculate the additional refrigerant needed, based on note above.*

Gaseous Charging

This procedure is accomplished with the unit operating. Electrical connections must be complete. Do not proceed until the system is ready to operate.

1. Connect R-22 drum with gauge manifold to the Schrader valves (pressure taps) on the compressor discharge and suction lines, Figure 12, p. 20.

Note: *On the TTA075A, 090A, 100A, 100B, 100C, 120A, 120B and 120C, the compressor access panel must be installed when the unit is running and being charged. The control box access panel must be removed, and the manifold hoses must be routed through an opening located in the bottom front of the control box. The opening has a pivoted cover plate.*

Note: *On the TTA125B, 150B, 155B, 180B, 155C, 180C, 200B and 240B, there is a 1 1/2" diameter refrigerant gauge access hole(s) with a removable silver cap located adjacent to the refrigerant line openings.*

⚠ WARNING
Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

2. Turn on power to the unit. Allow the system to run for 5 to 10 minutes to stabilize operating conditions.
3. Measure airflow across the indoor coil. Compare the measurements with the fan performance data in the Data/Submittal or Service Facts. Once proper airflow is established, observe the suction and head pressure gauges on the gauge manifold. Pressure reading should fall approximately at the points shown by the pressure curves in Service Facts. Add or remove refrigerant (gas only) as required to obtain correct head and suction pressures. Check suction line superheat and condenser sub-cooling to ensure the unit is operating properly.

4. Disconnect all power to the unit.

⚠ WARNING
Hazardous Voltage w/Capacitors!

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

5. Remove the charging system from the unit and close the opening in the bottom of the control box with the pivotal cover before attempting to replace the access panel.
6. Replace all panels.

Electrical Wiring

TTA field wiring consists of providing the line voltage power supply to the unit, installing the system indoor thermostat and providing low voltage system interconnecting wiring. Access to electrical connection locations are shown in Figure 2, p. 11 - Figure 8, p. 15.

⚠ WARNING
Ground Required!

Follow proper local and state electrical code on requirements for grounding. Failure to follow code could result in death or serious injury.

Unit Power Supply

The installer must provide line voltage circuit(s) to the unit main power terminals as shown by the unit wiring diagrams in Service Facts or field wiring. The power supply must include a disconnect switch in a location convenient to the unit. Ground the unit according to local codes and provide flexible conduit if codes require and/or if vibration transmission may cause noise problems.

⚠ WARNING
Ground Wire!

All field-installed wiring must be completed by qualified personnel. All field-installed wiring must comply with NEC and applicable local codes. Failure to follow this instruction could result in death or serious injuries.

NOTICE
Equipment Damage!

Use copper conductors only! Unit terminals are not designed to accept other types of conductors. Failure to do so could result in possible equipment damage.

Field Wiring- Electromechanical Control

⚠ WARNING
Hazardous Voltage w/Capacitors!

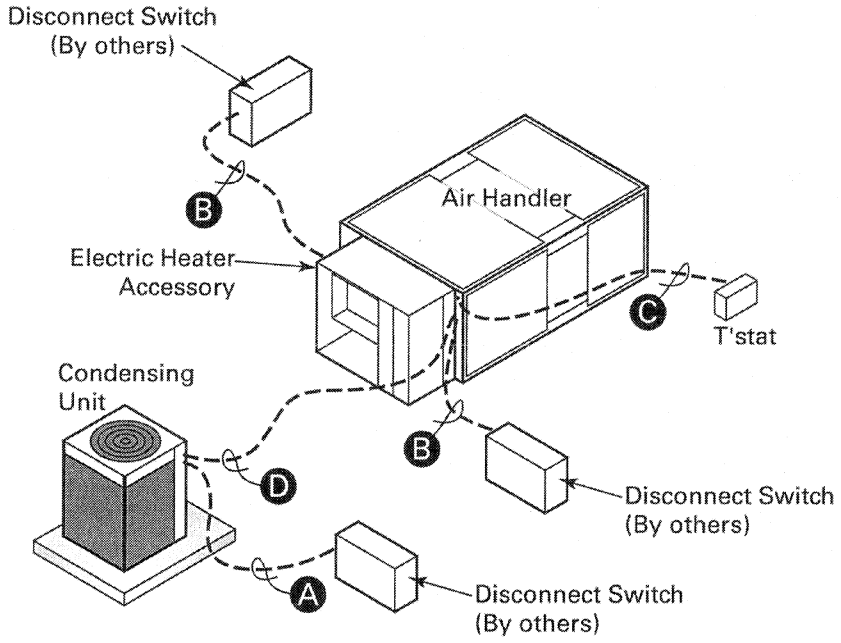
Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by the manufacturer or others, refer to the appropriate literature for allowable waiting periods for discharge of capacitors. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Determine proper wire sizes and unit protective fusing requirements by referring to the unit nameplate and/or the unit Service Facts. Field wiring diagrams for accessories are shipped with the accessory.

Low Voltage Wiring

Mount the indoor thermostat in accordance with the thermostat installation instructions. Install color-coded, weather-proof, multi-wire cable according to the Interconnecting Wiring diagrams in the Air Handler IOM.

Figure 13. Typical Field Wiring - Electromechanical Control



Notes:
1. Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.
2. When electric heater accessory is used, single point or dual point power entry is optional, since single point power option is through electric heater only.

TTA090A/TWE090A, TTA120A/TWE120A, TTA120C/TWE120

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase
   - 2 wires for single phase

C. Cooling only thermostat: 3 wires, 24 volts[1]
   - Digital thermostats: add 1 additional wire, 24 volt common
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

D. Add 4 wires, 24 volts
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

TTA120B/TWE120B

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase; 2 wires for single phase

C. Cooling only thermostat: 4 wires, 24 volts[2]
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

D. Add 5 wires, 24 volts

TTA150B/TWE180B, TTA180B/TWE180B, TTA240B/TWE240B, TTA180C/TWE180B

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase
   - 2 wires for single phase

C. Cooling only thermostat: 3 wires, 24 volts[2]
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

D. Add 5 wires, 24 volts

(2) TTA090A/TWE180B, (2) TTA120A/TWE240B

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase
   - 2 wires for single phase

C. Cooling only thermostat: 4 wires, 24 volts[2]
   - One stage electric heat: add 1 additional wire, 24 volts

[1] Choose only 1 of the following: thermostat, zone sensor, or NSB panel
[2] Choose only 1 of the following: thermostat, zone sensor, or NSB panel

- Two stage electric heat: add 2 additional wires, 24 volts

D. Add 6 wires, 24 volts

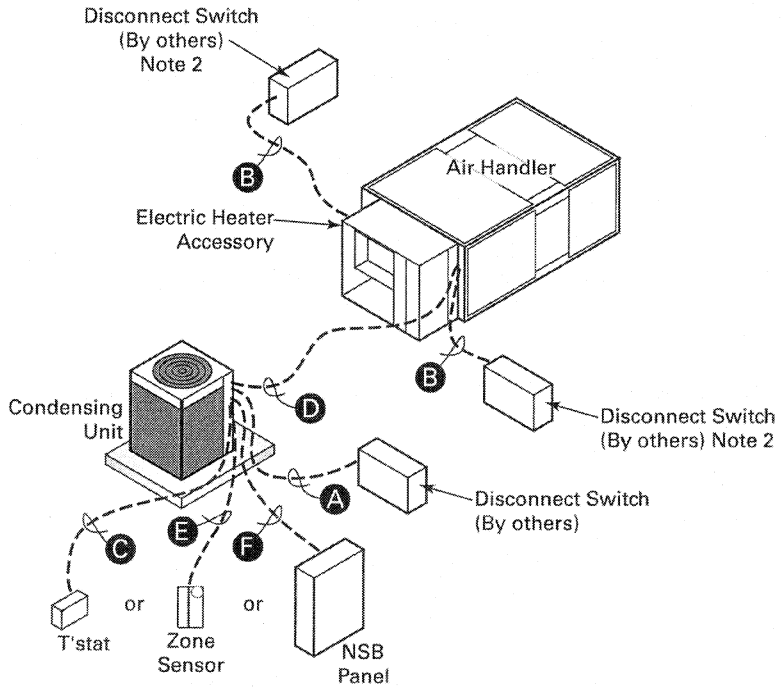
Note: *Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.*

Note: *When electric heater accessory is used, single point or dual point power entry is optional, since single point power option is through electric heater only.*

⚠ WARNING
Ground Required!

Follow proper local and state electrical code on requirements for grounding. Failure to follow code could result in death or serious injury.

Figure 14. Typical Field Wiring - ReliaTel™ Control



Notes:
1. Wiring shown with dashed lines is to be furnished and installed by the customer. All customer supplied wiring must be copper only and must conform to NEC and local electrical codes. Codes may require line of sight between disconnect switch and unit.
2. When electric heater accessory is used, single point or dual point power entry is optional, since single point power option is through electric heater only.

TTA090A/TWE090A, TTA120A/TWE120A

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase

- 2 wires for single phase

C. Cooling only thermostat: 3 wires, 24 volts[1]

- Digital thermostats: add 1 additional wire, 24 volt common

- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

D. Add 4 wires, 24 volts
- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

E. Zone sensor: 2 wires minimum or 10 wires maximum, 24 volts[1]
(# of wires are dependent upon zone sensor selection)

F. NSB Panel: 8 wires, 24 volts[1]

TTA120B & 100B/TWE120B & 100B, TTA120C/TWE120A

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase; 2 wires for single phase

C. Cooling only thermostat: 4 wires, 24 volts[1]
- Digital thermostats: add 1 additional wire, 24 volts
- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

D. Add 4 wires, 24 volts
- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

E. Zone sensor: 2 wires minimum or 10 wires maximum, 24 volts[1]
(# of wires are dependent upon zone sensor selection)

F. NSB Panel: 8 wires, 24 volts[1]

TTA150A/TWE180A, TTA120A/TWE120A, TTA240B/TWE240B, TTA180C/TWE180B

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase; 2 wires for single phase

C. Cooling only thermostat: 3 wires, 24 volts[1]
- Digital thermostats: add 1 additional wire, 24 volts
- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

D. Add 4 wires, 24 volts
- One stage electric heat: add 1 additional wire, 24 volts
- Two stage electric heat: add 2 additional wires, 24 volts

E. Zone sensor: 2 wires minimum or 10 wires maximum, 24 volts[1]
(# of wires are dependent upon zone sensor selection)

F. NSB Panel: 8 wires, 24 volts[1]

[1] Choose only 1 of the following: thermostat, zone sensor, or NSB panel
[1] Choose only 1 of the following: thermostat, zone sensor, or NSB panel

(2) TTA090A/TWE180B, (2) TTA120A/TWE240B

Field Wiring:

A. 3 power wires, line voltage

B. 3 power wires, line voltage for 3 phase; 2 wires for single phase

C. Cooling only thermostat: 6 wires, 24 volts[1]
   - Digital thermostats: add 2 additional wires, 24 volt common
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

D. Add 8 wires, 24 volts
   - One stage electric heat: add 1 additional wire, 24 volts
   - Two stage electric heat: add 2 additional wires, 24 volts

E. Zone sensor: 2 wires minimum or 10 wires maximum, 24 volts[1]
(# of wires are dependent upon zone sensor selection)

F. NSB Panel: 8 wires, 24 volts[1]

Field Wiring

Figure 15. Night Setback Panel Field Wiring

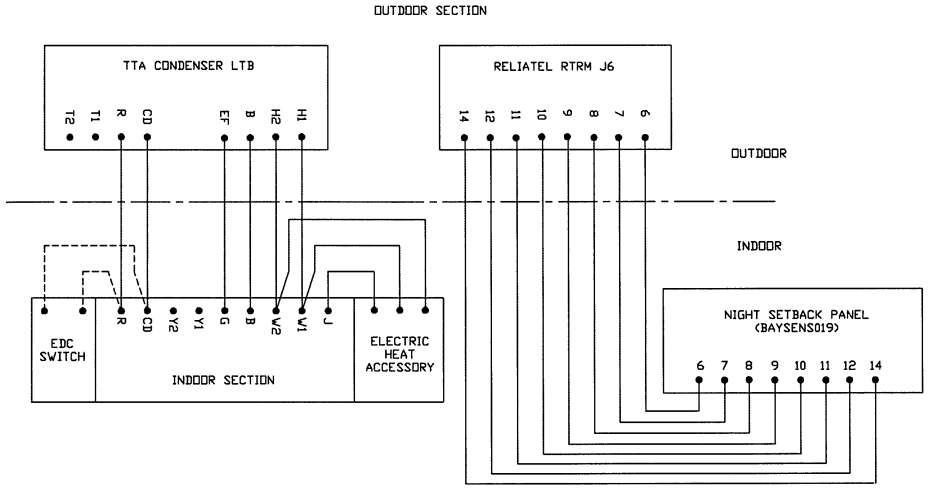


Figure 16. Zone Sensor Field Wiring

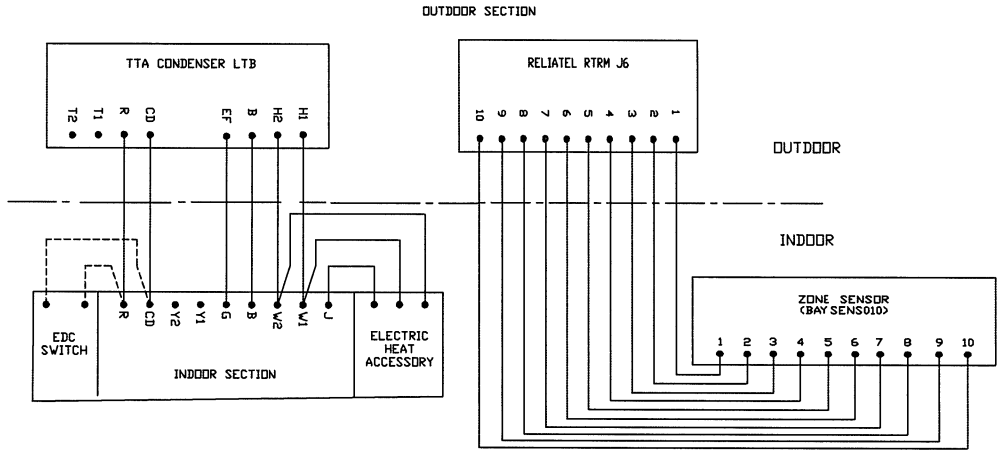
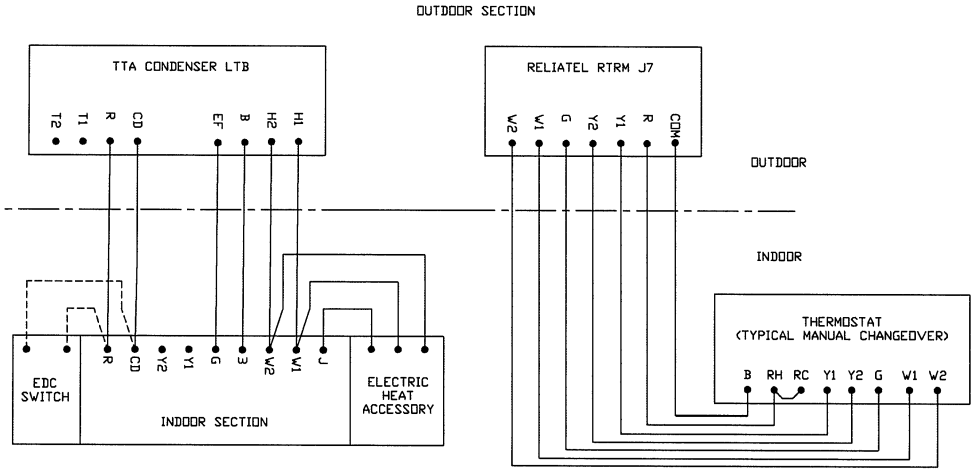
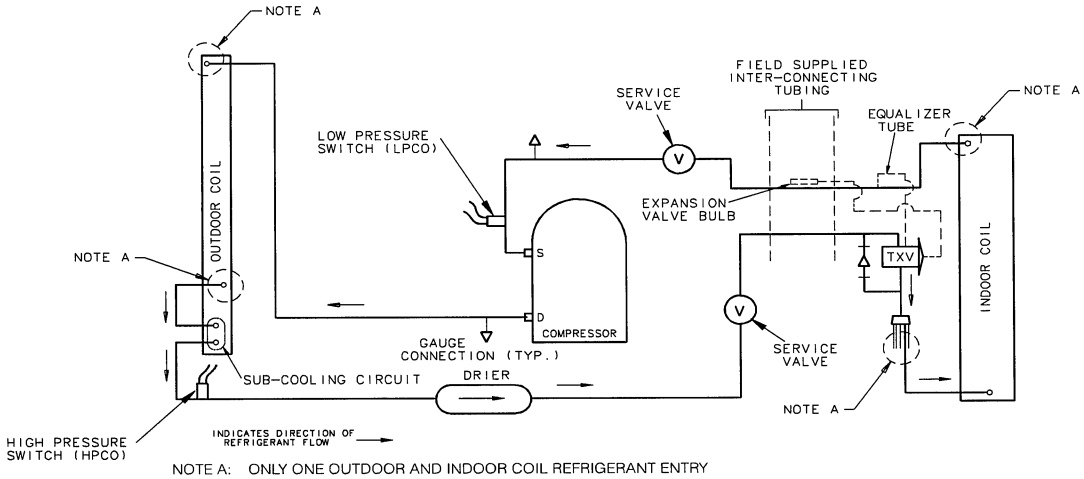


Figure 17. Zone Sensor Field Wiring



Refrigerant Circuit

Figure 18. Typical Split System Cooling



NOTE A: ONLY ONE OUTDOOR AND INDOOR COIL REFRIGERANT ENTRY AND EXIT CIRCUIT IS SHOWN; ALL MODELS HAVE MULTIPLE ENTRY AND EXIT CIRCUITS.

Pre-Start

Control Circuit Features

Note: *Not all of these features may be required for your unit, check electrical schematic.*

Low Outdoor Ambient Cooling

The Evaporator Defrost Control is standard equipment on Air Handlers and will permit low ambient cooling down to 35°F. For cooling operation down to 0°F, use an Accessory Head Pressure Control on the outdoor unit.

Evaporator Defrost Control (EDC)

This control is located in the Air Handler of Split Units. The control's sensing tube is embedded vertically in the evaporator coil, near the center. This device will stop the compressor if the indoor coil temperature drops below its setting. The indoor air will still circulate across the coil, bringing the temperature of the coil back up to the cut-in temperature of the evaporator defrost control.

Low Pressure Cut-Out (LPCO)

This control's sensor is located in the suction (gas) line, near the compressor. This control will stop the compressor and the outdoor fans if suction pressure drops below the Low Pressure Cut-Out setting. Once the suction pressure has returned to normal, the compressor and outdoor fans will cycle back on.

High Pressure Cut-Out (HPCO)

This control's sensor is located in the discharge line. This device will shut off the compressor and the outdoor fan(s) if the discharge pressure exceeds the High Pressure Cut-Out's setting. Once the discharge pressure has returned to normal, the compressor will cycle back on.

Internal Overload Protector (IOL)

This device is a current/thermal actuated warp switch, embedded in the compressor motor windings. It will shut off the compressor if the discharge temperature or current of the compressor windings exceeds its design trip temperature.

Note: *The IOL will place (auto reset) the compressor back in operation once the compressor motor heat has dropped below the trip setting; however, a check of the refrigerant and electrical systems should be made to determine the cause and be corrected.*

Installation Checklist

Complete this checklist once the unit is installed to verify that all recommended procedures have been accomplished before starting the system. Do not operate the system until all items covered by this checklist are complete.

1. Inspect unit location for proper required service clearances.
2. Inspect unit location for proper free air clearances.
3. Inspect unit location for secure, level mounting position.

Refrigerant Piping

1. Properly sized/constructed liquid and suction lines connected to stubs at both the indoor and outdoor units?
2. Insulated the entire suction line?
3. Insulated portions of liquid line exposed to extremes in temperature?
4. Performed initial leak test?
5. Evacuated each refrigerant circuit to 350 microns?
6. Charged each circuit with proper amount of R-22?

Electrical Wiring

1. Provided unit power wiring (with disconnect) to proper terminals in the unit control section?
2. Installed system indoor thermostat?
3. Installed system low voltage interconnecting wiring to proper terminals of outdoor unit, indoor unit and system thermostat?

Start-Up

Electromechanical Controls

Unit Model Number Digits 9 and 10 = 00 or 0S

Sequence of Operation

Once the unit is properly installed and pre-start procedures are complete, start the unit by turning the System Switch on the indoor thermostat to either HEAT, COOL or AUTO. The system should operate normally.

NOTICE

Equipment Damage!

Ensure the disconnect for the indoor air handler is closed before operating the system. Operating the indoor unit without the indoor fan energized can cause unit trip-out on high pressure control and/or liquid flood back to the compressor.

General

Operation of the system cooling (and optional heating) cycles is controlled by the position of the system switch on the room thermostat. Once the system switch is placed in either the HEAT or COOL position, unit operation is automatic. The optional automatic changeover thermostat, when in the AUTO position, automatically changes to heat or cool with sufficient room temperature change.

Evaporator Fan (Indoor Supply Air)

The evaporator fan is controlled by an ON/AUTO switch on the room thermostat. With the switch positioned at AUTO and the system operating in the cooling mode, fan operation coincides with the cooling run cycles. If the system is equipped with heat and is operating in the heating mode while the fan switch is at AUTO, fan operation coincides with the heating run cycles. When the fan switch is positioned to ON, fan operation is continuous.

Cooling Mode

With the disconnect switch in the ON position, current is supplied to the compressor sump heater(s) and control transformer. The sump heater(s) supplies heat to the compressor(s) during the "Off" cycle. The transformer steps down the line voltage to 24V for the low voltage control circuit. When the room thermostat system switch is positioned at COOL and the fan switch is at AUTO, the compressor contactor energizes on a call for cooling.

When the contacts of the compressor contactor close, operation of the compressor and condenser fan begins. The evaporator fan contactor also energizes on a call for cooling and initiates evaporator fan operation.

On units with dual circuits, the second stage of cooling is initiated as a result of the 2-stage thermostat calling for additional cooling.

ReliaTel™ Control

Unit Model Number Digits 9 and 10 = 0R, 0T, OU or OW

Sequence of Operation

Once the unit is properly installed and pre-start procedures are complete, start the unit by turning the System Switch on the indoor thermostat to either HEAT, COOL or AUTO. The system should operate normally.

NOTICE

Equipment Damage!

Ensure the disconnect for the indoor air handler is closed before operating the system. Operating the indoor unit without the indoor fan energized can cause unit trip-out on high pressure control and/or liquid flood back to the compressor.

The ReliaTel™ Controls is a microelectronic control feature, which provides operating functions that are significantly different than conventional Electromechanical units. The ReliaTel™ Refrigeration Module (RTRM) uses Proportional/Integral control algorithms to perform specific unit functions that govern the unit operation in response to application conditions.

The RTRM provides compressor anti-short cycle timing functions through minimum "Off" and "On" timing to increase reliability, performance and to maximize unit efficiency. Upon power initialization, the RTRM performs self-diagnostic checks to ensure that all internal controls are functioning. It checks the configuration parameters against the components connected to the system. The Light Port LED located on the RTRM module is turned "On" within one second after power-up if all internal operations are okay.

ReliaTel™ Control Cooling Mode

For Zone Sensor Control:

When the system switch is set to the COOL position and the zone temperature rises above the cooling setpoint, the RTRM energizes the compressor relay coil located on the RTRM. When the compressor relay contacts close, the compressor contactor coil is energized provided the low and high pressure controls are closed. When the compressor contacts close, the compressor and the outdoor fan motor start to maintain the zone temperature to within ± 2°F of the sensor setpoint at the sensed location.

On units with dual circuits, the second stage of cooling is initiated as a result of the Proportional/ Integral control algorithms calling for additional cooling.

For Thermostat Control:

When the room thermostat system switch is positioned at COOL and the fan switch is at AUTO, the RTRM energizes the compressor relay coil located on the RTRM during a call for cooling. When the compressor relay contacts close, the compressor contactor coil is energized provided the low and high pressure controls are closed.

When the contacts of the compressor contactor close, operation of the compressor and condenser fan begins. The evaporator fan contactor also energizes on a call for cooling and initiates evaporator fan operation.

On units with dual circuits, the second stage of cooling is initiated as a result of the 2-stage thermostat calling for additional cooling.

Note: *Irregular unit operation may occur when the unit is controlled with a triac-switching thermostat. Please review the approved thermostat vendor list for all recommended relay-switching thermostats.*

ReliaTel™ Control Evaporator Fan Operation

When the fan selection switch is set to the AUTO position, the RTRM energizes the evaporator fan relay coil approximately 1 second after energizing the compressor contactor coil in the cooling mode. In the heating mode, the RTRM energizes the evaporator fan relay coil approximately 1 second before energizing the electric heat contactors. In cooling mode, when the cooling cycle is terminated, the RTRM will allow the evaporator fan relay coil to remain energized for 80 seconds on single compressor units and 60 seconds on multiple compressor units to extract "free" cooling from the indoor coil. When the heating cycle is terminated, the evaporator fan relay coil is de-energized at the same time as the heater contactors. When the fan selection switch is set to the ON position, the RTRM keeps the evaporator fan relay coil energized for continuous fan motor operation.

ReliaTel™ Control Heating Operation

When the system switch is set to the HEAT position and heating is required, the RTRM energizes the Heat 1 relay coil. When the Heat 1 relay contacts close, the first stage electric heat contactor is energized. If the first stage of electric heat cannot satisfy the heating requirement, the RTRM energizes the Heat 2 relay coil. When the Heat 2 relay contacts close, the second stage electric heat contactor is energized. The first and second stages of heat are cycled "On" and "Off" as required to maintain the zone.

Service Test Modes ReliaTel™ Controls

Test Modes

Upon power initialization, the RTRM performs self-diagnostic checks to ensure that all internal controls are functional. It also checks the configuration parameters against the components connected to the system. The Liteport LED located on the RTRM module is turned "On" within one second of power-up if internal operation is okay.

Use one of the following "Test" procedures to bypass some time delays and to start the unit at the control panel. Each step of unit operation can be activated individually by temporarily shorting across the "Test" terminals for 2 to 3 seconds. The Liteport LED located on the RTRM module will blink when the test mode has been initiated. The unit can be left in any "Test" step for up to one hour before it will automatically terminate, or it can be terminated by opening the main power disconnect switch. Once the test mode has been terminated, the Liteport LED will glow continuously and the unit will revert to the "System" control. There are three methods in which the "Service Test" can be cycled at LTB-Test 1(T1) and LTB-Test 2 (T2).

1. Step Test Mode

This method initiates the different components of the unit, one at a time, by temporarily shorting across the two test terminals for 2 to 3 seconds.

For the initial start-up of the unit, this method allows the technician to cycle a component "On" and have up to one hour to complete the check. Service Test Mode will be ignored if a short is present across Test 1 and Test 2 at start-up.

2. Resistance Test Mode

This method can be used for start-up providing a decade box for variable resistance outputs is available. This method initiates the different components of the unit, one at a time, when a specific resistance value is placed across the two test terminals. The unit will remain in the specific test mode for approximately one hour even though the resistance is left on the test terminals.

3. Auto Test Mode

This method is not recommended for start-up due to the short timing between individual component steps. This method initiates the different components of the unit, one at a time, when a fixed jumper is installed across the test terminals. The unit will start the first test step and change to the next step every 30 seconds. At the end of the test mode, control of the unit will automatically revert to the applied "System" control method. For unit test steps, test modes and step resistance values to cycle the various components, refer to Table 6.

Table 6. Service Test Guide for Component Operation

Test Step	Mode	Fan	Comp 1	Comp 2	Heat 1	Heat 2	Ohms
1	Fan	On	Off	Off	Off	Off	2.2KW
2	Cool 1	On	On[a]	Off	Off	Off	4.7KW
3[b]	Cool 2	On	On[a]	On[a]	Off	Off	6.8KW
4[b]	Heat 1	On	Off	Off	On	Off	10KW
5[b]	Heat 2	On	Off	Off	On	On	15KW

(a) The condenser fans will operate any time a compressor is ON providing the outdoor air temperature is within the operating value.
(b) Steps for optional accessories and non-applicable modes in unit will be skipped.

Maintenance

Perform all of the indicated maintenance procedures at the intervals scheduled. This will prolong the life of the unit and reduce the possibility of costly equipment failure.

Monthly

Conduct the following maintenance inspections once per month.

The following warning complies with State of California law, Proposition 65.

⚠ WARNING
Fiberglass Wool!

Product contains fiberglass wool. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation. Glass wool fibers may also cause respiratory, skin or eye irritation.

⚠ WARNING
Hazardous Voltage w/Capacitors!

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

NOTICE
Operating Under Vacuum

Do not operate or apply power to the compressor while under a vacuum. Failure to follow these instructions will result in compressor failure.

1. Inspect air filters and clean if necessary.
2. Check unit wiring to ensure all connections are tight and that the wiring insulation is intact.
3. Check drain pans and condensate piping to insure they are free of obstacles.
4. Manually rotate the indoor fan to ensure proper operation.
5. Inspect the evaporator and condenser coils for dirt and debris. If the coils appear dirty, clean them.
6. With the unit operating in the cooling mode, check the suction and discharge pressures and compare them with Pressure Curve values in unit Service Facts. Record these readings on the "Maintenance Log."
7. Observe indoor fan operation and correct any unusual or excessive vibration. Clean blower wheels as needed.

Annually (Cooling Season)

The following maintenance procedures must be performed at the beginning of each cooling season to ensure efficient unit operation.

1. Perform all of the monthly maintenance inspections.
2. With the unit operating, check unit superheat and record the reading in the "Maintenance Log."
3. Remove any accumulation of dust and/or dirt from the unit casing.
4. Remove corrosion from any surface and repaint. Check the gasket around the control panel door to ensure it fits correctly and is in good condition to prevent water leakage.

5. Inspect the evaporator fan belt. If it is worn or frayed, replace it.
6. Inspect the control panel wiring to ensure that all connections are tight and that the insulation is intact.

Lubricate the indoor fan motor bearing with a non detergent 20-weight oil. (To ensure good bearing lubrication, condenser fan motor bearings should be lubricated once every six months.

Note: *Some motors are permanently lubricated.*

7. Check refrigerant piping and fittings for leaks.

Precautionary Measures

- Avoid breathing fiberglass dust.
- Use a NIOSH approved dust/mist respirator.
- Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing: rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator in these situations.

First Aid Measures

Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.

Skin Contact - Wash affected areas gently with soap and warm water after handling.

Maintenance Log

Date	Ambient Temp. (°F)	Evaporator Entering Air		Compressor				Superheat (°F)		Subcooling (°F)	
				Suction Pressure		Discharge Pressure					
		Dry Bulb	Wet Bulb	(C1)	(C2)	(C1)	(C2)	Circuit #1	Circuit #2	Circuit #1	Circuit #2

Note: Perform each inspection once per month (during cooling season) while unit is operating

Troubleshooting

Troubleshooting ReliaTel™ Controls

The RTRM has the ability to provide the service personnel with some unit diagnostics and system status information. Before turning the main power disconnect switch "Off," follow the steps below to check the ReliaTel™ Refrigeration Module (RTRM). All diagnostics & system status information stored in the RTRM will be lost when the main power is turned "Off."

⚠ WARNING
Hazardous Service Procedures!

The maintenance and troubleshooting procedures recommended in this section of the manual could result in exposure to electrical, mechanical or other potential safety hazards. Always refer to the safety warnings provided throughout this manual concerning these procedures. When possible, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks. Failure to follow all of the recommended safety warnings provided, could result in death or serious injury.

Note: *The J6 & J7 screw terminals must be tightened in order to accurately measure voltage in the required steps.*

1. Verify that the Liteport LED on the RTRM is burning continuously. If the LED is lit, go to Step 3.
2. If the LED is not lit, verify that 24 VAC is present between J1-1 and J1-2. If 24 VAC is present, proceed to Step 3. If 24 VAC is not present, check the unit main power supply, check transformer (TNS1). Proceed to Step 3 if necessary.
3. Utilizing "Method 1" or "Method 2" in the "System Status Diagnostic" section, check the following:
   a. System status
   b. Heating status
   c. Cooling status
4. If a System failure is indicated, proceed to Step 4. If no failures are indicated, proceed to Step 5. If a System failure is indicated, recheck Step 1 and Step 2. If the LED is not lit in Step 1, and 24 VAC is present in Step 2, then the RTRM has failed. Replace the RTRM.
5. If no failures are indicated, use one of the TEST mode procedures described in the "Unit Start-Up" section to start the unit. This procedure will allow you to check all of the RTRM outputs, and all of the external controls (relays, contactors, etc.) that the RTRM outputs energize, for each respective mode. Proceed to Step 6.
6. Step the system through all of the available modes, and verify operation of all outputs, controls and modes. If a problem in operation is noted in any mode, you may leave the system in that mode for up to one hour while troubleshooting. Refer to the sequence of operations for each mode, to assist in verifying proper operation. Make the necessary repairs and proceed to Step 7 and Step 8.
7. If no abnormal operating conditions appear in the test mode, exit the test mode by turning the power""Off" at the main power disconnect switch.
8. Refer to the individual component test procedures if other microelectronic components are suspect.

System Status Checkout Procedure

"System Status" is checked by using one of the following two methods:

Method 1. If the Zone Sensor Module (ZSM) is equipped with a remote panel with LED status indication, you can check the unit within the space. If the ZSM does not have LED's, use Method 2. BAYSENS010B, BAYSENS011B, BAYSENS019A, BAYSENS020A, BAYSENS021A & BAYSENS023A all have the remote panel indication feature. The LED descriptions are listed below.

LED 1 (System)

- "On" during normal operation.
- "Off" if a system failure occurs or the LED fails.
- "Flashing" indicates test mode.

LED 2 (Heat)

- "On" when the heat cycle is operating.
- "Off" when the heat cycle terminates or the LED fails.
- "Flashing" indicates a heating failure.

LED 3 (Cool)

- "On" when the cooling cycle is operating.
- "Off" when the cooling cycle terminates or the LED fails.
- "Flashing" indicates a cooling failure.

The following information describes the complete listing of failure indication causes.

System Failure

Check the voltage between terminals 6 and 9 on J6, it should read approximately 32 VDC. If no voltage is present, a System failure has occurred. Refer to Step 4 in the previous section for the recommended troubleshooting procedure.

Cooling Failure

1. Cooling and heating set point (slide pot) on the zone sensor has failed. Refer to the "Zone Sensor Test Procedure" section.
2. Zone temperature thermistor ZTEMP on ZTS failed. Refer to the "Zone Sensor Test Procedure" section.
3. CC1 or CC2 24 VAC control circuit has opened, check CC1 & CC2 coils, and any of the controls below that apply to the unit (HPC1, HPC2).
4. LPC1 has opened during the 3 minute minimum "on time" during 4 consecutive compressor starts, check LPC1 or LPC2 by testing voltage between the J1-8 & J3-2 terminals on the RTRM and ground. If 24 VAC is present, the LPCs have not tripped. If no voltage is present, LPCs have tripped.

Simultaneous Heat and Cool Failure

1. Emergency Stop is activated.

Method 2. The second method for determining system status is done by checking voltage readings at the RTRM (J6). The system indication descriptions and the approximate voltages are listed below.

System Failure

Measure the voltage between terminals J6-9 & J6-6.

- Normal Operation = approximately 32 VDC

- System Failure = less than 1 VDC, approximately 0.75 VDC
- Test Mode = voltage alternates between 32 VDC & 0.75 VDC

⚠ WARNING
Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

Heat Failure

Measure the voltage between terminals J6-7 & J6-6.

- Heat Operating = approximately 32 VDC
- Heat Off = less than 1 VDC, approximately 0.75 VDC
- Heating Failure = voltage alternates between 32 VDC & 0.75 VDC

Cool Failure

Measure the voltage between terminals J6-8 & J6-6.

- Cool Operating = approximately 32 VDC
- Cool Off = less than 1 VDC, approximately 0.75 VDC
- Cooling Failure = voltage alternates between 32 VDC & 0.75 VDC

To use LED's for quick status information at the unit, purchase a BAYSENS010*ZSM and connect wires with alligator clamps to terminals 6 through 10. Connect each respective terminal wire (6 through 10) from the Zone Sensor to the unit J6 terminals 6 through 10.

Note: *If the system is equipped with a programmable zone sensor, (BAYSENS019*, or BAYSENS023*), the LED indicators will not function while the BAYSENS010* is connected.*

Resetting Cooling and Heating Lockouts

Cooling Failures and Heating Lockouts are reset in an identical manner. Method 1 explains resetting the system from the space; Method 2 explains resetting the system at the unit.

Note: *Before resetting Cooling Failures and Heating Lockouts check the Failure Status Diagnostics by the methods previously explained. Diagnostics will be lost when the power to the unit is disconnected.*

Method 1. To reset the system from the space, turn the MODE selection switch at the zone sensor to the OFF position. After approximately 30 seconds, turn the MODE selection switch to the desired mode, i.e. HEAT, COOL or AUTO.

Method 2. To reset the system at the unit, cycle the unit power by turning the disconnect switch "Off" and then "On."

Lockouts can be cleared through the building management system. Refer to the building management system instructions for more information.

Zone Temperature Sensor (ZTS) Service Indicator

The ZSM SERVICE LED is a generic indicator that will signal the closing of a Normally Open switch at any time, providing the Indoor Motor (IDM) is operating.
This indicator is usually used to indicate an airside fan failure. The RTRM will ignore the closing of this Normally Open switch for 2 (±1) minutes. This helps prevent nuisance SERVICE LED indications.

Temperature Tests

Note: *These procedures are not for programmable or digital models and are conducted with the Zone Sensor Module electrically removed from the system.*

Test 1 - Zone Temperature Thermistor (ZTEMP)

This component can be tested by measuring the resistance between terminals 1 and 2 on the Zone Temperature Sensor. Below are some typical indoor temperatures, and corresponding resistive values.

Zone Temperature	Nominal Resistance
50°F or 10.0°C	19.9 Kohms
55°F or 12.8°C	17.47 Kohms
60°F or 15.6°C	15.3 Kohms
65°F or 18.3°C	13.49 Kohms
70°F or 21.1°C	11.9 Kohms
75°F or 23.9°C	10.50 Kohms
80°F or 26.7°C	9.3 Kohms
85°F or 29.4°C	8.25 Kohms
90°F or 32.2°C	7.3 Kohms

Test 2 - Cooling Set Point (CSP) and Heating Set Point (HSP)

Cool SP = Terminals 2 and 3.

Range = 100 to 900 Ohms approximate

Heat SP = Terminals 2 and 5

Range = 100 to 900 Ohms approximate

Test 3 - System Mode and Fan Selection

The combined resistance of the Mode selection switch and the Fan selection switch can be measured between terminals 2 and 4 on the Zone Sensor. The possible switch combinations are listed in Table 7 with their corresponding resistance values.

Table 7. Test 3 — System Mode and Fan Selection

Resistance Valves (Ohms)	Zone Sensor Unit/ Fan Mode	Local Unit Mode	Local Fan Mode
2.32K	Off/Auto	Off	Auto
4.87K	Cool/Auto	Cool	Auto
7.68K	Auto/Auto	Auto	Auto
10.77K	Off/On	Off	On
13.32K	Cool/On	Cool	On
16.13K	Auto/On	Auto	On
19.48K	Heat/Auto	Heat	Auto
27.93K	Heat/On	Heat	On
35.0K	Emergency Heat/Auto	Emergency Heat	Auto
43.45K	Emergency Heat/On	Emergency Heat	On
Out of Range (Short)	INVALID/Short	Invalid (CV), Auto (VAV)	Invalid
Out of Range (Open)	INVALID/Open	Invalid (CV), Off (VAV)	Invalid

Test 4 - LED Indicator Test, (SYS ON, HEAT & COOL)

Method 1. Testing the LED using a meter with diode test function. Test both forward and reverse bias. Forward bias should measure a voltage drop of 1.5 to 2.5 volts, depending on your meter. Reverse bias will show an Over Load, or open circuit indication if LED is functional.

Method 2. Testing the LED with an analog Ohmmeter. Connect Ohmmeter across LED in one direction, then reverse the leads for the opposite direction. The LED should have at least 100 times more resistance in reverse direction, as compared with the forward direction. If high resistance in both directions, LED is open. If low in both directions, LED is shorted.

Method 3. To test LED's with ZSM connected to unit, test voltages at LED terminals on ZSM. A measurement of 32 VDC, across an unlit LED, means the LED has failed.

Note: *Measurements should be made from LED common (ZSM terminal 6 to respective LED terminal). Refer to the Zone Sensor Module (ZSM) Terminal Identification table at the beginning of this section.*

Programmable & Digital Zone Sensor Test

Testing serial communication voltage

⚠ WARNING
Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

2. Verify 24 VAC is present between terminals J6-14 & J6-11.
3. Disconnect wires from J6-11 and J6-12. Measure the voltage between J6-11 and J6-12, should be about 32 VDC.
4. Reconnect wires to terminals J6-11 and J6-12. Measure voltage again between J6-11 and J6-12, voltage should flash high and low every 0.5 seconds. The voltage on the low end will measure about 19 VDC, while the voltage on the high end will measure from approximately 24 to 38 VDC.
5. Verify all modes of operation, by running the unit through all of the steps in the "Test Modes" section discussed in "Unit Start-Up."
6. After verifying proper unit operation, exit the test mode. Turn the fan on continuously at the ZSM, by pressing the button with the fan symbol. If the fan comes on and runs continuously, the ZSM is good. If you are not able to turn the fan on, the ZSM is defective.

RTCI Loss of communications

If the RTCI loses input from the building management system, the RTRM will control in the default mode after approximately 15 minutes. If the RTRM loses the Heating and Cooling setpoint input, the RTRM will control in the default mode instantaneously. The temperature sensing thermistor in the Zone Sensor Module is the only component required for the "Default Mode" to operate.

Warranty

TTA (Parts Only)

This warranty is extended by Trane to the original purchaser and to any succeeding owner of the real property to which the Air Conditioner is originally affixed, and applies to products purchased and retained for use within the U.S.A. and Canada. There is no warranty against corrosion, erosion or deterioration.

If any part of your Air Conditioner fails because of a manufacturing defect within one year from the date of original purchase, Warrantor will furnish without charge the required replacement part.

In addition, if the sealed motor-compressor(s) fail(s) because of a manufacturing defect within the second through fifth year from the date of original purchase, Warrantor will furnish without charge a replacement compressor(s). Warrantor's obligations and liabilities under this warranty are limited to furnishing F.O.B. Warrantor factory or warehouse replacement parts for Warrantor's products covered under this warranty. Warrantor shall not be obligated to pay for the cost of lost refrigerant. No liability shall attach to Warrantor until products have been paid for and then liability shall be limited solely to the purchase price of the equipment under warranty shown to be defective.

THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, AND IN NO EVENT SHALL WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Trane, 2701 Wilma Rudolph Blvd., Clarksville, TN 37040-1008
Attention: Manager, Product Service

TW-338-0597

* This warranty is for commercial usage of said equipment and not applicable when the equipment is used for a residential application. Commercial use is any application where the end purchaser uses the product for other than personal, family or household purposes.

Commercial Equipment Rated 20 Tons and Larger and Related Accessories (Parts Only)

Products Covered — This warranty is extended by Trane, and applies only to commercial equipment rated 20 tons and larger and related accessories purchased and retained for use within the U.S.A. and Canada.

Warrantor warrants for a period of 12 months from initial start-up or 18 months from date of shipment, whichever is less, that the products covered by this warranty (1) are free from defects in material and manufacture, and (2) have the capacities and ratings set forth in catalogs and bulletins; provided, that no warranty is made against corrosion, erosion or deterioration. Warrantor's obligations and liabilities under this warranty are limited to furnishing, F.O.B. factory replacement parts (or equipment at the option of Warrantor) for all Warrantor's products not conforming to this warranty. Warrantor shall not be obligated to pay for the cost of lost refrigerant. No liability whatever shall attach to Warrantor until said products have been paid for and then said liability shall be limited to the purchase price of the equipment shown to be defective.

THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, AND IN NO EVENT SHALL WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Trane—Warrantor, 2701 Wilma Rudolph Blvd., Clarksville, TN 37040

GW-598-4799

Wiring Diagram Matrix

WIRING DIAGRAM NO.	DIAGRAM TYPE	UNIT MODEL NO'S
4367-0325	ElectroMechanical Connection and Schematic	TTA120B3, TTA120B4, TTA120BW, TTA100BD, TTA150B3, TTA150B4, TTA150BW, TTA125BD, TTA120BK, TTA150BK
4367-0326	ElectroMechanical Connection and Schematic	TTA100CD, TTA120C3, TTA120C4, TTA120CW
4367-0327	ElectroMechanical Connection and Schematic	TWA090A3, TWA090A4, TWA090AW, TWA120A4, TWA120AW, TWA075AD, TWA100AD
4367-0335	ElectroMechanical Connection and Schematic	TTA155BD, TTA180B3, TTA180B4, TTA180BW, TTA180BK, TTA200BD, TTA240B4, TTA240BW, TTA240BK
4367-0336	ElectroMechanical Connection and Schematic	TTA240B3
4367-0337	ElectroMechanical Connection and Schematic	TTA155CD, TTA180C3, TTA180C4, TTA180CW
4367-0338	ElectroMechanical Connection and Schematic	TWA200BD, TWA240B4, TWA240BW
4367-0339	ElectroMechanical Connection and Schematic	TWA155BD, TWA180B3, TWA180B4, TWA180BW
4367-0340	ElectroMechanical Connection and Schematic	TWA240B3
4367-0341	ElectroMechanical Connection and Schematic	TTA120A3
4367-0342	ElectroMechanical Connection and Schematic	TTA075AD, TTA085AD,TTA090A3, TTA090A4, TTA090AW, TTA090AK, TTA100AD, TTA120A4, TTA120AW, TTA120AK
4367-0343	ElectroMechanical Connection and Schematic	TWA090A3, TWA090A4, TWA090AW, TWA120A4, TWA120AW, TWA075AD, TWA100AD
4367-0344	ElectroMechanical Connection and Schematic	TWA120A3
4367-0345	ReliaTel Connection and Schematic	TTA240B3
4367-0346	ElectroMechanical Connection and Schematic	TWE060A3, TWE060C3
4367-0347	ElectroMechanical Connection and Schematic	TWE090A1, TWE120A1
4367-0349	ElectroMechanical Connection and Schematic	TWE155BD, TWE180BW, TWE180B3, TWE180B4, TWE180BK, TWE200BD, TWE240BW, TWE240B3, TWE240B4, TWE240BK, TWE155CD, TWE180CW, TWE180C3, TWE180C4, TWE180CK, TWE200CD, TWE240CW, TWE240C3, TWE240C4, TWE240CK
4367-0350	ElectroMechanical Connection and Schematic	TWE090B3, TWE120B3, TWE120BK
4367-0351	ElectroMechanical Connection and Schematic	TWE100BD, TWE120BW
4367-0352	ElectroMechanical Connection and Schematic	TWE060B1, TWE090B1, TWE120B1
4367-0353	ElectroMechanical Connection and Schematic	TWE060B3
4367-0354	ElectroMechanical Connection and Schematic	TWE060B4
4367-0355	ElectroMechanical Connection and Schematic	TWE090AK, TWE090A3, TWE090C3, TWE120AK, TWE120A3, TWE120C3
4367-0356	ElectroMechanical Connection and Schematic	TWE060A1, TWE060C1
4367-0357	ElectroMechanical Connection and Schematic	TWE050AD, TWE060AK, TWE060AW, TWE060A4, TWE060CW, TWE060C4
4367-0358	ElectroMechanical Connection and Schematic	TWE075AD, TWE090AW, TWE100AD, TWE120AW, TWE090CW, TWE120CW
4367-0359	ReliaTel Connection and Schematic	TTA155BD, TTA180B3, TTA180B4, TTA180BW, TTA180BK, TTA200BD, TTA240B4, TTA240BW, TTA240BK
4367-0360	ReliaTel Connection and Schematic	TTA155CD, TTA180C3, TTA180C4, TTA180CW
4367-0361	ReliaTel Connection and Schematic	TTA100CD, TTA120C3, TTA120C4, TTA120CW
4367-0362	ReliaTel Connection and Schematic	TTA120B3, TTA120B4, TTA120BW, TTA100BD, TTA150B3, TTA150B4, TTA150BW, TTA125BD, TTA120BK, TTA150BK
4367-0363	ReliaTel Connection and Schematic	TTA075AD, TTA085AD, TTA090A3, TTA090A4, TTA090AW, TTA090AK, TTA100AD, TTA120A4, TTA120AW, TTA120AK
4367-0364	ReliaTel Connection and Schematic	TTA120A3
4367-0444	ReliaTel Connection and Schematic	TTA200FD, TTA240F4, TTA240FW, and TTA240FK

Notes: Wiring diagrams are available via e-Library.

Literature Order Number	SS-SVX08A-EN
Date	January 2009
Supersedes	SS-SVX08A-EN (May 2008)

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Labor and equipment required to remove and reconnect existing roof mounted equipment as part of roofing and seismic improvement work.

1.2 RELATED REQUIREMENTS

A. Section 01 11 00 - Summary of Work: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.

B. Section 02 41 00 - Demolition: Selective demolition, site demolition, structure removal.

C. Section 23 05 00 - Basic HVAC Requirements.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with demolition and installation of new roof surfacing, modification of roof curbs, and removal and reinstallation of roof mounted equipment.

1.4 CODES AND INSPECTIONS

A. Comply with applicable codes and standards regarding minimum requirements for materials, methods, and labor practices not otherwise stated in this section.

1.5 ASBESTOS

A. Do not use any material containing asbestos on this project.

B. Provide written confirmation that all materials used in work of this section are asbestos-free.

1.6 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Certificate: Certify that products of this section meet or exceed specified requirements.

C. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.7 QUALITY ASSURANCE

A. Electrical Contractor Qualifications: Electrical work shall be performed by Oregon State Licensed Electrical Contractors.

1.8 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 GENERAL

A. Materials and products used in permanent construction shall be new, in appropriate quality, and suitable for work intended purpose.

B. Provide products and materials necessary for temporary operation or relocation during modification and relocation of existing HVAC units.

2.2 PRODUCTS

A. Disconnect Switches: Heavy duty class switches rated for the equipment and appropriate for the location of installation. Provide phenolic nameplates to indicate equipment served.

B. Electrical Metallic Tubing (EMT). Use concealed above grade or exposed indoors where not subject to physical damage.
   1. Fittings: Case steel compression type or set screw type.
   2. Substitutions: See Section 01 60 00 – Product Requirements.

C. Wire and Cable: Copper, #12 minimum. 600 Volt rated, type THHN-THWN or THW.

D. Watertight Flexible Conduit: UL listed for sunlight resistance.
   1. Carlon Electrical Products; Product: Carflex Liquidtight Line; www.carlon.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

E. GFCI Receptacles: Specification grade meeting Federal Specification W-C-596E and NEMA Standard WD-1. Amperage and voltage required for equipment.
   1. Manufacturers:
      a. Hubble; GF-5362-G.
      b. Arrow Hart; GF5342G.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

F. GFCI Cover Plates: Waterproof; UL listed for wet locations.
   1. Manufacturers:
      a. TayMac; No. 20310.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify work required at each HVAC unit to achieve flashing requirements indicated on Drawings.

3.2 PREPARATION

A. Protection of In-Place Conditions:
   1. Protect existing mechanical equipment, buildings, adjacent roofs materials, and work of other trades.

3.3 PERFORMANCE

A. Temporarily disconnect roof or attic mounted equipment required to be removed for installation of products by other trades.

B. Provide temporary connections and by-pass of systems as required for equipment to remain active during the work.

C. Do not damage equipment or work of other trades during disconnection and removal.

D. Coordinate shutdown, disconnection, removal, and replacement of equipment with Owner.

E. Reinstall and reconnect equipment. Verify operation of reconnected equipment.

F. Install disconnect switches accessible from the roof on all rooftop mechanical equipment. Replace standard roof mounted receptacles (all non-GFCI receptacles accessible from the roof in vicinity of work) with ground fault circuit interrupter (GFCI) receptacles. Provide weather proof covers.

G. Replace existing flexible conduit at roof mounted equipment with liquid tight nonmetallic flexible conduit and as noted on Drawings.

H. Remove any unused or abandoned raceway and wiring.

I. Modify existing electrical connections to accommodate minor changes in location of equipment, such as Owner-furnished exhaust fan replacements of existing.

J. Remove and reinstall existing electrical conduit and wiring on roof surfaces to be reworked. Extend lengths and heights as required.

3.4 CLOSEOUT ACTIVITIES

A. See Section 01 77 00 - Closeout Procedures.

B. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION