PURCHASING OFFICE
P.O. BOX 3371
PHONE 813-247-8050
FAX 813-247-0907

Cal Henderson, Sheriff

HILLSBOROUGH COUNTY
TAMPA, FLORIDA 33601

May 20, 1999

FISCAL BUREAU
2008 E. 8th Avenue
Tampa, FL 33605

SENIOR BUYER
JANE MERRIAM
(813) 247-8049

BID TITLE: REPLACEMENT OF BUILT UP ROOF (BUR) AND ROOF TOP HVAC UNITS

BID NUMBER:18-99

INSTRUCTIONS TO BIDDERS

Included herein are General Terms and Provisions (Part A); the Special Provisions (Part B); Special Conditions of Contract (Part C); the Technical Specifications (Part D); the Bid Proposal (Part E) and the Attachment Drawings, which together with all attachments, constitute the entire "Bid Proposal". Said bid package must be the basis upon which all bid proposals are offered and the same (the entire bid package) must be kept together and returned, intact, by the time and at the place herein specified. The bidder must manually sign the General Terms and Provisions (Part A) and Bid Proposal (Part E). Any questions concerning this bid package should be directed to the Buyer whose name appears above.

When awarded, the bid package becomes a part of the "**Contract Document**". The Bidder's signature on the bid constitutes Bidder's agreement to the terms therein. READ THE ENTIRE BID CAREFULLY BEFORE SIGNING.

NOTICE TO BIDDERS

WHEN SUBMITTING A SEALED BID, ALL BIDS SHOULD BE CLEARLY MARKED AS A BID DOCUMENT. THIS IDENTIFICATION SHOULD INCLUDE THE BID NUMBER, BID TITLE, DATE AND TIME DUE ON THE OUTSIDE OF THE ENVELOPE.

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HILLSBOROUGH COUNTY SHERIFF
REQUEST FOR BID NO. 18-99
REPLACEMENT OF BUILT UP ROOF (BUR) AND ROOF TOP HVAC UNITS

LETTER OF INTENT

The undersigned acknowledges the General Terms and Provisions of this Request for Bid and intends to respond to the Bid. We understand that any changes, clarification and addenda to the Bid will be promptly communicated to the individual authorized below to receive this information.

_____
Name

_____
Company Name

_____
Address

_____

_____

_____
Telephone Number

_____ Will attend the Pre-Bid Conference

NOTE: IF YOU PLAN TO ATTEND THE PRE-BID CONFERENCE, THIS FORM SHOULD BE FORWARDED TO THE ATTENTION OF THE BUYER OR FAX TO 813-247-0907. CALL THE BUYER IF YOU HAVE ANY QUESTIONS.

DO NOT SUBMIT THIS FORM WITH YOUR BID. THIS FORM IS INTENDED TO BE SENT TO PURCHASING IN ADVANCE TO NOTIFY OUR OFFICE OF YOUR INTENT TO ATTEND THE PRE-BID CONFERENCE.

HILLSBOROUGH COUNTY SHERIFF'S OFFICE
2008 E 8th Avenue
Tampa, FL 33605

VENDOR: May 20, 1999

SUBJECT: REQUEST FOR BID NUMBER 18-99

BID TITLE: REPLACEMENT OF BUILT UP ROOF (BUR) AND ROOF TOP HVAC UNITS

OPENING DATE & TIME: JUNE 17, 1999 @ 3:00 P. M.

PLACE: **Sheriff's Operation Center**
Purchasing Office, Room 125
2008 E. 8th Avenue
Tampa, FL 33605

Bids will be received until the time and date shown and will be read aloud immediately thereafter at the "Place" indicated above.

PRE-BID CONFERENCE: JUNE 3, 1999 @ 10:00 A. M.

PLACE: **Morgan Street Jail**
Conference Room #8326
1301 N. Morgan St.
Tampa, FL 33602

PART A - GENERAL TERMS AND PROVISIONS:

1. Bids: Must be contained in a SEALED envelope addressed to: Cal Henderson, Sheriff, 2008 E. 8th Avenue, Tampa, Florida 33605. To prevent inadvertent opening, the bid package must be marked as a BID DOCUMENT (including the bid number) on the outside of the envelope.

   If our drawings and specifications, included in our Request for Bid, are not returned with your bid, and no specific reference is made to them in your bid, it will be assumed that all requirements will be met. When material, sketches, cuts, descriptive literature, vendor's or manufacturer's specifications which accompany the bid contain information that can be construed or is intended to be a deviation from our specifications, such deviation must be specifically referenced in your bid response.

2. The responsibility for getting the bid to the Sheriff's Office on or before the stated time and date will be solely and strictly the responsibility of the bidder. The Sheriff will in no way be responsible for delays caused by the United States Postal Service or a delay caused by any other occurrence, or any other method of delivery. The bidder shall be responsible for reading very carefully and understanding completely the requirements in the contract documents. Bids will not be accepted after the time specified for receipt. Such bids shall be returned to the vendor unopened with the notation "This Bid Was Received After the Time Designated For the Receipt and Opening of Bids".

3. Time for Consideration: Bidder warrants by virtue of bidding the prices quoted in his bid will be good for an evaluation period of forty-five (45) calendar days from the date of bid opening unless otherwise stated. Bidders will not be allowed to withdraw or modify their bids after the opening time and date.

4. Prices: All bids submitted must show the net bid price after any and all discounts allowable have been deducted. **Price(s) bid is/are to be F.O.B. Destination**. State Sales tax and federal excise taxes shall not be included as the Sheriff's Office is tax-exempt. The Sheriff will issue exemption certificates to the successful bidder when requested.

   The Bidder's attention is directed to the fact that the tax laws of the State of Florida, including but not limited to Chapter 212, Florida Statutes, apply to this present bid matter and that all applicable taxes and fees shall be deemed to have been included in Bidder's proposal as part of his materials cost, when applicable.

5. Bid Errors: When errors are found in the extension of bid prices, the unit price will govern. Bids having erasures or corrections must be initialed in ink by the bidder.

6. Condition of Materials & Packaging: Unless otherwise indicated, it is understood and agreed that any item offered or shipped on this bid shall be NEW and in FIRST CLASS CONDITION, that all containers shall be new and suitable for storage or shipment and that prices include standard commercial packaging for the items shipped.

7. Claims: The successful bidder will immediately replace missing or damaged items and will be responsible for making any and all claims against carriers.

8. When to Make Delivery: Deliveries resulting from this bid are to be made during the normal working hours of the Sheriff's Office. It is the bidder's responsibility to obtain this information.

9. Manufacturer's Name: Any manufacturers' names, trade names, brand names information and/or catalog numbers used herein are for purpose of description, reference, and establishing general quality levels. Such references are not intended to be restrictive and products of any manufacturer may be offered if they are approved as equals. The determination as to whether any alternate product or service is or is not equal shall be made by the Sheriff's Office and such determination shall be final and binding upon all bidders.

10. Information and Descriptive Literature: Bidder must furnish all information requested in the bid. If specified, each bidder must submit cuts, sketches, descriptive literature and/or complete specifications covering the products offered. Reference to literature submitted with previous bid will not satisfy this provision. Bids which do not comply with these requirements will be subject to rejection.

11. Bid Submittal Costs: Submittal of a bid is solely at the cost of the bidder and the Sheriff's Office in no way is liable or obligates itself for any cost accrued to the bidder in coming up with the Bid Submittal.

12. No Bid: If the receipt of this request for bid is not acknowledged, Bidder's name may be removed from the bidders' mailing list.

13. On-Line Documents: The Hillsborough County Sheriff’s Office is publishing documents on it’s web page for the convenience of vendors wanting to do business with the Sheriff and to save tax dollars. This service is public record and the Sheriff is responsible only for documents as published. Any modifications or alterations to the original document language may be cause for rejection of a bid.

14. Compliance with Occupational Safety and Health Act: Bidder certifies that all material, equipment, etc., contained in his bid meets all O.S.H.A. requirements.

15. Public Entity Crimes: Pursuant to Florida Statute 287-132-133, effective July 1, 1989, the Hillsborough County Sheriff, as a public entity, may not accept any bid from, award any contract to, or transact any business in excess of the threshold amount provided in Section 287.017, F.S., for Category Two (currently $10,000) with any person or affiliate on the convicted vendor list for a period of 36 months from the date that person or affiliate was placed on the convicted vendor list unless that person of affiliate has been removed from the list pursuant to Section 287.133 (3)(f), F.S.

Furthermore, any person or affiliate entering into an agreement with the Hillsborough County Sheriff as of July 1, 1989 will be required to file a sworn statement with the contracting officer on Florida Department of General Services Form PUR 7068 indicating their status with the State of Florida prior to providing goods or services to the Hillsborough County Sheriff.

The form must be filled in completely including proper checks in the spaces provided. Corrections to the form will not be allowed after the bid opening date and time. Failure to complete this form in every detail, submit it with your bid and/or have the form on file with this office will result in immediate disqualification of your bid.

If you are submitting a bid on behalf of dealers or suppliers who will ship commodities and receive payment from the resulting contract, it is your responsibility to see that copies of the form are executed by them and are included with your bid package

16. Acceptance and Rejection: The Sheriff, Hillsborough County, Florida, reserves the right to reject any or all bids, for cause, to waive irregularities, if any, in any bid, and to accept the bid or bids which in the judgement of the Sheriff is in the best interest of Hillsborough County.

17. Before submitting bid proposals, Bidders must carefully examine the site of the proposed work and make all necessary investigations to inform themselves thoroughly as to all difficulties involved in the completion of all work required pursuant to the mandates and requirements of this bid package. No pleas of ignorance of conditions or difficulties that may exist prior to the bid opening time or of conditions or difficulties that may be encountered in the execution of the work pursuant to this package as result of failure to make necessary and reasonable examinations and investigations will be accepted as an excuse for any failure or omission on the part of the successful Bidder (Contractor) to fulfill, in every detail, all of the requirements of the Contract Documents, nor will they be accepted as a basis for any claims whatsoever for extra compensation or for any extension of time.

18. Delivery Time/Liquidated Damages: Bidders are hereby advised that if the Contract Documents so indicate, an amount determined for liquidated damages at the rate specified shall be assessed against the successful Bidder not complying with a stated delivery time or performance time (or similarly stated information).

19. Assignment of Contract: Bidder may not make any assignment of the resulting contractual agreement between the parties, in whole or in part, without prior written authorization as may be given at the sole discretion of the Hillsborough County Sheriff's Office.

CAL HENDERSON, SHERIFF
HILLSBOROUGH COUNTY, FLORIDA

By _____
J.H. Shillady, Comptroller
Fiscal Bureau

20. General Terms and Provisions outlined above are acknowledged. Our bid is attached.

Date_____ Signed_____
Company Officer

_____
Company Name

NOTE: THIS MUST BE RETURNED WITH YOUR BID AFTER COMPLETING PARAGRAPH 20. EXCEPTIONS TO THE SPECIFICATIONS, IF ANY, MAY BE NOTED ON THE SPECIFICATION PAGE OR IN YOUR BID RESPONSE.

PART B - SPECIAL PROVISIONS

1. GENERAL REQUIREMENTS

It is the intent of these specifications to describe the requirements of the Hillsborough County Sheriff's Office to provide labor, materials and equipment necessary to replace the Built-Up Roof (BUR) and Roof Top HVAC Units at the Morgan Street Jail. All work will be accomplished in accordance with specification and requirements furnished within the bid documents and drawings and any addenda issued.

2. PRE-BID CONFERENCE

All interested parties are invited to attend pre-bid conference, (see Page 1 of Part A) for date, time and street location. At this time the Sheriff's representative(s) will be available to answer questions relative to this Bid. Any suggested modifications may be presented in writing or discussed with the Sheriff's representative(s) at this meeting and may be considered by said representative(s) as possible amendments to the Bid. If you have any questions concerning this matter call the buyer, Jane Merriam (813)-247-8049.

3. BID SUBMITTALS

All bids will be submitted in quadruplicate (1 original and 3 copies) on the forms provided in this document and assembled, in page number order, to insure that each proposal is reviewed and evaluated properly. The original copy WILL BE MARKED AS SUCH on the front of the document. If additional pages are required for further description, 8-1/2" x 11" sheets must be used. If a cover letter is provided, it shall be no longer than two (2) pages in length and shall serve as a introduction to and summary of the bid. DO NOT DEVIATE FROM THIS FORMAT. Bids should be as concise as possible without omitting any necessary details.

4. EXAMINATION OF SITE

Bidders shall visit the site and familiarize themselves with existing conditions and satisfy themselves as to the nature and scope of the work required. The submission of a bid will be construed as evidence that such an examination has been made. Any materials and/or labor, not reflected in the drawings or specifications, required for completion of the work, shall be submitted with the bid. Later claims for labor, equipment or materials required, will not be allowed.

5. MEASUREMENTS AND DIMENSIONS

Before ordering materials or doing work which is dependent for proper size, or installation upon coordination with site conditions, the Bidder shall verify all dimensions at the site and shall be responsible for the correctness of same. No consideration will be given any claim based on the difference between the actual dimensions and those indicated on the drawings. Any discrepancies between the drawings and/or specifications and the existing conditions shall be referred to the owner for adjustments before any work is commenced.

6. VENDOR QUALIFICATIONS

Vendors may be required to furnish evidence in writing that they maintain permanent places of business and have adequate equipment, finances and personnel to furnish the item or service offered satisfactorily and expeditiously. The Hillsborough County Sheriff's Office reserves the right to inspect the vendor's place of business and equipment prior to award of any contract, for determining ability to meet terms and conditions as set forth herein.

Contractor shall be properly licensed and/or registered with the State of Florida, Hillsborough County, and/or City of Tampa, as applicable for the appropriate category of work specified in the bid. All required licenses, registration and/or certifications must be current and effective as of the bid opening date and must be maintained throughout the life of the contract. Failure to be properly licensed and/or certified as of the bid opening date may result in the rejection of the bid as non-responsive. Contractors are advised to provide proper documentation, as requested, with your bid response.

Vendor shall employ only qualified operators and workmen who are skilled in roofing repairs, and installation of systems referenced for bid. We may require screening of employees and require satisfactory personal references in order to determine the character of employees.

7. CONTRACTUAL OBLIGATIONS

The successful Bidder may not sublet or subcontract any the contractual obligations concerning this bid matter except as provided for in the written contract between the Sheriff's Office and Contractor. This statement does not prohibit subcontracting of the work but does prohibit subcontracting overall management obligations pertaining to the work and requires the contractor to retain ultimate liability for all contractual obligations.

8. QUALIFICATION OF PERSONNEL, SUBCONTRACTORS, VENDORS, AND SUPPLIERS

a. The Contractor agrees, within seven (7) calendar days of receipt of a written request from the Sheriff's Office, to promptly remove any personnel employed or retained by the Contractor, whom the Sheriff's Office may request in writing to be removed, with or without cause. Any substitution submitted by the Contractor shall be acceptable to the Sheriff and at no additional cost.

b. The Contractor agrees, within seven (7) calendar days of receipt of a written request from the Sheriff's Office, to promptly remove and replace any Subcontractors employed or retained by the Contract, whom the Sheriff's Office shall request in writing to be removed with or without cause. If the Sheriff's Office requires the removal of any Subcontractor, the Contractor shall submit a substitute acceptable to the Sheriff's Office, and the Contract Price may be increased or decreased by the reasonable difference in costs associated with such substitution, providing proof of increase or decrease is provided. If the Sheriff's Office request was made without cause an appropriate Change Order will be issued.

c. EMPLOYEE CLEARANCE: All employees and/or sub-contractors of the Contractor who will work in Hillsborough County Jail Facilities, may be required to have a background clearance by the Sheriff's Office prior to beginning work. All employees must comply with the Sheriff's written policy and procedures relating to security. Contractor shall be required to provide a work crew list giving all personnel names and any changes as they occur. A list of materials and equipment shall be provided by the Contractor to the Project Manager on a as needed basis, especially materials, equipment or suppliers that physically enter the jail.

9. PRECONSTRUCTION CONFERENCE

Prior to the start of construction, a joint meeting shall be held with representatives of prime Contractor, Sheriff's Office staff, and other invited parties or government agencies which may be affected by or have jurisdiction over the project. This meeting is intended to introduce the various key personnel from each organization and to discuss the start of construction, order of work, labor and legal requirements, insurance requirements, names of the major subcontractors, method of payment, shop drawing requirements, protection of existing facilities, and other pertinent items associated with the project.

10. CONTRACT DOCUMENTS

A) Precedence

The Contract Documents comprise the entire agreement between the Sheriff's Office and Contractor concerning the Work and may be altered only by a Change Order.

It is the intent of the Contract Documents to describe the total Work to be constructed. The Contract Documents are complementary. What is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error, or discrepancy in the Contract Documents, he will call it to the Architect's attention in writing before proceeding with the Work. The Architect will respond with a written clarification. Any delays associated with the clarification will be considered for time extensions only, but no damages for delay will be allowed. In resolving such conflicts, errors, and discrepancies, the Contract Documents shall be given preference in terms of the most stringent requirements as determined by the Project Manager. Enforcement of the most stringent requirements will be at the Sheriff's option. Figure dimensions on the Drawings (when provided) shall govern over scale dimensions, and the detailed Drawing shall govern over general Drawings. Any work that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials, or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards. In case of conflict, the more stringent requirements shall take precedence.

Clarifications and interpretations of the Contract Documents shall be issued by the Buyer. The Contract Documents will be governed by the Laws of the State of Florida.

B) Reuse of Documents

Neither Contractor nor any subcontractor, manufacturer, fabricator, supplier, or distributor shall have or acquire any title or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of the Architect. They shall not reuse any of them on extensions of the Project or any other project.

11. AWARD

Award shall be made to the lowest responsible and responsive bidder meeting specifications, price and other factors considered. The Sheriff's Office reserves the right to award by line item or by overall total, whichever is deemed in the best interest of the Hillsborough County Sheriff.

In the event two (2) or more vendors have submitted the lowest and best bids, preference may be given in the award in the following order. First, to the vendor who has his/her principal place of business in Hillsborough County; second, to the vendor who has a place of business in Hillsborough County; and, third, if the vendors involved in the "tie bid" situation are all located inside/outside Hillsborough County, the toss of a coin will be used to break the tie.

Award notification will be sent to vendors receiving a bid award. Bid results will be available at our web site http://www.hcso.tampa.fl.us, on the Purchasing Page. If you do not have internet access, and would like a copy of the bid results, contact the Purchasing Office at (813) 247-8034.

The evaluation of the bids and the determination as to equality of commodity/service offered shall be the sole and final responsibility of the Hillsborough County Sheriff's Office and will be based on information and/or samples furnished by the vendor.

12. ALTERNATES

Alternate brand names and models will be considered only if identical in application performance quality and warranty. Bidders submitting alternate proposals must indicate brand name and model number. Manufacturer's specification sheets shall be furnished with your bid.

13. APPROPRIATIONS OF FUNDS

The Hillsborough County Sheriff, as an entity of Government, is subject to the appropriation of funds by the Hillsborough County Board of County Commissioners in an amount sufficient to allow continuation of its performance in accordance with the terms and conditions of any contract entered into as a result of this request for each and every fiscal year following the fiscal year in which this contract is executed and entered into and for which the contract shall remain in effect. The Hillsborough County Sheriff's Office shall, upon receipt of notice that sufficient funds are not available to continue its full and faithful performance under the contract, provide prompt written notice of such event and effective thirty (30) calendar days after the giving of such notice, or upon the expiration of the period of time for which funds were appropriated, whichever occurs first, be thereafter released of all further obligations in any way related to such contract.

14. DEFAULT

The contract may be cancelled or annulled by the Hillsborough County Sheriff's Fiscal Director in whole or in part by written notice of default to the Contractor upon non-performance or violation of contract terms. An award may be made to the next low responsive & responsible bidder, or articles specified may be purchased on the open market similar to those so terminated. Failure of the contractor to deliver materials or services within the time stipulated in these specifications, unless extended in writing by the Fiscal Director, shall constitute contract default. Vendors who default on contracts may be removed from the vendor mailing lists for future contracts at the discretion of the Fiscal Director.

15. CANCELLATION

When deemed to be in the best interest of the Hillsborough County Sheriff's Office, any contract(s) resulting from this specification may be cancelled by the following means:

a. Ten (10) calendar days written notice with cause, or;
b. Thirty (30) calendar days written notice without cause.

If it becomes necessary to terminate the agreement/contract without cause, all services and/or materials provided through the date of receipt of written notice of cancellation may be invoiced to the Hillsborough County Sheriff's Office and will be considered for payment providing documentation of said expenses are forwarded with the request for payment.

16. NEXT LOW BIDDER

In the event of a default by the awarded vendor, the Hillsborough County Sheriff's Office reserves the right to utilize the next low responsive and responsible bidder as the new awardee. In the event of this occurrence, the next low responsive and responsible bidder shall be required to provide the bid items/services at the prices as contained on their proposal for this specification for the completion of the project.

17. ADDITION/DELETION

The Hillsborough County Sheriff's Office reserves the right to add or delete any items from this bid or resulting contract(s) when deemed to be in the best interest of the County.

18. WARRANTIES

A. The Contractor shall warrant all workmanship and materials on the replacement of the roof for a period of no less than twenty (20) years from the date of final acceptance. Special warranties shall be provided as specified under sections in the Technical Specifications.

1) The Contractor warrants and guarantees that all materials and equipment will be new unless otherwise specified and that all work will be of good quality, performed in a workmanlike manner, free from faults or defects, and in accordance with the requirements of the Contract Documents and any inspections, tests, or approvals referred to below. All unsatisfactory Work, all faulty Work and all Work not conforming to the requirements of the Contract Documents or such inspections, tests, approvals, or all applicable building construction and safety requirements shall be considered defective. Notice of all defects shall be given to the Contractor by the Architect. All defective Work, whether or not in place, may be rejected, corrected, or accepted as provided in Paragraph D.

2) If the Contract Documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Architect timely notice of readiness therefore.

The testing firm(s) if assigned by the Sheriff's Office to this project and all such inspections, tests, or approvals provided for by the Sheriff's Office shall be identified in writing by the Project Manager to the Contractor. All other inspections, tests or approvals shall be at the Contractor's expense including additional expenses for inspection and tests required as a result of delays by the contractor or hours worked beyond 40 hours in a work week. For all required inspections, tests, and approvals on any Work prepared, performed, of assembled away from the site, the Contractor will furnish the Architect with the required Certificates of Inspection, testing, or approval. All such tests will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organizations as may be required by law or the Contract Documents. Materials or Work in place that fail to pass acceptability tests shall be retested at the direction of the Architect and at the Contractor's expense. If any such Work required to be inspected, tested, or approved is covered without written approval of the Architect, it shall be, it requested by the Architect, uncovered for observation in accordance with Paragraphs 18. A., 4 and 5. The rates charged the Contractor pursuant to this paragraph shall be agreed upon in writing prior to testing.

3) Neither observations by the Architect or inspections, tests, or approvals by persons other than the Contractor shall relieve the Contractor of his obligations to perform the work in accordance with the requirements on the Contract Document.

4) If any work is covered contrary to the request of the Architect, the Work shall, if requested by the Architect, be uncovered for observation and replaced at the Contractor's expense.

5) If any Work has been covered which the Architect has not specifically requested to observe or if the Architect considers it necessary or advisable that covered Work be inspected or tested by other, the Contractor, by written request, will uncover, expose, or otherwise make available for observation inspection, or testing that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such work is defective, the Contractor will bear the expense of such uncovering, exposure, observation, inspection, testing, and satisfactory reconstruction. If, however, such Work is not found to be

defective, the Contractor will be allowed an increase in the Contract price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, inspection, testing, and reconstruction, if he makes a claim.

B) When directed by the Architect, the Contractor will promptly, without cost to the Sheriff's Office and as specified by the Architect, either correct the defective Work whether fabricated, installed, or completed, or remove it from the site and replace it with non-defective Work. If the Contractor does not correct such defective Work or remove and replace such defective Work within a reasonable time, all as specified in a written notice from the Architect, the Sheriff's Office, after forty-eight (48) hours, may have the deficiency corrected. All direct and indirect costs of such correction shall be paid by the Contractor or deducted from payment to the Contractor. The Contractor will also bear the expense of making good all Work of others destroyed or damaged by correction, removal, or replacement of this defective work.

C) During the warranted period, the Contractor will restore or remove and replace warranted work to its original specified condition in the event of failure. He will restore or remove and replace other work which has been damaged by failure of warranted work, or which must be removed and replaced to gain access to warranted work. Cost of restoration or removal and replacement is the obligation of the Contractor. Upon restoration or removal and replacement the warranted work which has failed, Contractor will reinstate the warranty by issuing an addendum to the original warranty for at least the remaining warranted period, but for no less than half of the original warranted period.

D) If, instead of requiring correction or removal and replacement of defective Work, the Sheriff's Office prefers to accept it, the Sheriff's Office may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be executed by incorporating the necessary revisions in the Contract Documents, included an appropriate reduction in the Contract Price. If the acceptance occurs after approval, the Contractor shall pay an appropriate sum to compensate for the defect in the Work to the Sheriff's Office.

19. CERTIFICATE OF INSURANCE

The Contractor shall not commence any work or order any materials in connection with this Contract until he has obtained all the following types of insurance and such insurance has been approved by the Hillsborough County Sheriff's Office, nor shall the Contractor allow any Sub-Contractor to commence work on his sub-contract until all similar insurance required of the Sub-Contractor has been so obtained and approved. All insurance policies shall be with insurers qualified and doing business in Florida.

Worker's Compensation Insurance

The Contractor shall take out and maintain during the life of this Contract, Worker's Compensation Insurance for all of his employees connected with the work of this project and, in case any work is sublet, the Contractor shall require the Sub-Contractor similarly to provide Worker's Compensation Insurance for all the Latter's employees unless such employees are covered by the protection afforded by the Contractor. Such insurance shall comply fully with the Florida Worker's Compensation Law. In case any hazardous work under this contract at the site of the project is not protected under the Worker's Compensation statute, the Contractor shall provide, and cause each Sub-Contractor to provide adequate insurance, satisfactory to the Hillsborough County Sheriff's Office, for the protection of his employees not otherwise protected.

Contractor's Public Liability and Property Damage Insurance

The Contractor shall take out and maintain during the life of this Contract, Comprehensive General Liability Insurance (including operations, completed operations, products, contractual, and owners and contractors protective liability) and Comprehensive Automobile Liability Insurance and shall protect himself from claims for damage for personal injury, including accidental death, as well as claims for property damage which may arise from operations under this Contract whether such operations be by himself or by anyone directly or indirectly employed by him, and the amounts of such insurance shall be the minimum limits as follows:

Comprehensive General Liability	$1,000,000 bodily injury and property damage combined single limit.
Automobile	$1,000,000 bodily injury and property damage combined single limit.

20. BID SECURITY

Each Bid shall be accompanied by a bid security made payable to the Hillsborough County Sheriff pledging that the Bidder will enter into a contract with the Hillsborough County Sheriff on the terms stated in his Bid and will furnish bonds as described hereunder in this section of these specifications covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Should the Bidder refuse to enter into such contract or fail to furnish such bonds, when required, the amount of the bid security shall be forfeited to the Hillsborough County Sheriff as liquidated damages, not as a penalty.

The amount of the bid security shall be five percent (5%) of the maximum amount bid. Security shall be either a certified check, cashier's check, treasurer's check, bank draft, or bid bond issued by a surety company licensed to conduct business in the State of Florida. Bonds shall be written on the surety company's standard form, and the Attorney-In-Fact who executes the bond on behalf of the surety company shall affix to the bond a certified and current copy of his Power of Attorney, indicating the monetary limit of such power.

The Hillsborough County Sheriff 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 have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all bids have been rejected.

21. PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND

Bond Requirements: The Hillsborough County Sheriff shall, prior to the execution of the Contract, require the successful Bidder to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in such form and amount as listed hereunder. Premiums for Bonds shall be paid by the successful Bidder. The successful Bidder shall submit this document to Purchasing prior to commencing any work or ordering materials for the Work.

The Surety company shall be licensed to transact surety business in Florida, shall be certified to issue the total amount of the bond on any one risk, and shall be otherwise acceptable to the Hillsborough County Sheriff's Office.

Time of Delivery and Form of Bonds: The successful Bidder shall deliver the required bonds to the Hillsborough County Sheriff no later than the date of execution of the Contract.

"Performance and Payment Bond" shall be for 100% of the Contract sum in behalf of the Hillsborough County Sheriff. The bonds shall be written on the Surety company's standard form.

The successful Bidder shall require the Attorney-In-Fact who executes the required bonds on behalf of the Surety company to affix to the bond a certified and current copy of his Power of Attorney, indicating monetary limit of such power.

Alternative Forms of Security: In lieu of the bond required by this section, the successful Bidder may file with the Hillsborough County Sheriff's Office, an alternative form of security which shall be in the form of cash, money order, certified check, cashier's check, or irrevocable letter of credit. Such alternative forms of security shall be for the same purpose and shall be subject to the same conditions as those applicable to the bond required by this section. The determination of the value of such alternative forms of security shall be made by the Hillsborough County Sheriff's Office.

Release of Bonds: Bonds will be released after all conditions of the contract have been met, final acceptance has been given and all inspections have been satisfied and a statement of warranty and release of lien has been issued.

22. INDEMNIFICATION

The contractor will indemnify and hold harmless the Sheriff's Office and its employees and agents from and against all liabilities, claims, damages, losses, and expenses, including attorneys' fees arising out of or resulting from the performance of its Work, provided that any such liability, claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom and (b) is cause in whole or in part by an act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, whether or not it is caused in whole or in part by a party indemnified hereunder.

In any and all claims against the Sheriff's Office or any of its agents or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under the previous paragraph shall not be limited in any way as to the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workmen's compensation acts, disability benefit acts, or other employee benefit acts.

The Contractor will indemnify and hold harmless the Sheriff's Office and anyone directly or indirectly employed by it from and against all claims, damages, losses, and expenses (including attorney's fees) arising out of any infringement of patent rights of copyrights held by others and shall defend all such claims in connection with any alleged infringement of such rights.

23. PROJECT CONDITIONS

A) Availability of Lands: The Sheriff's Office will furnish, at the times indicated in the Contract Documents, the lands upon which the Work is to be done, rights-of-way for access thereto, and such other lands which are designated for use by the Contractor. Easements for permanent structures or permanent changes in existing facilities will be obtained by the Sheriff's Office unless otherwise specified in the Contract Documents. If the Contractor believes that any delay in the Sheriff's Office furnishing of these lands or easements is valid reason for an extension of the Contract Time, Contractor may make a claim for such time extension, but in no event will the Contractor be entitled to any damages or additional compensation for such delay. The Contractor will provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. Upon request, the Project Manager will furnish the Contractor copies of all available boundary surveys and subsurface tests.

B) Unknown or Concealed Conditions:

1) If conditions are encountered, excluding existing utilities, at the site which are (a) subsurface of otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (b) unknown physical conditions of an unusual nature, which 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, then the Contractor shall give the Sheriff's Office notice thereof promptly before conditions are disturbed and in no event later than 48 hours after first observance of the conditions.

2) The Architect will promptly investigate such conditions, and, if 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, the Architect will recommend an equitable adjustment in the Contract Price or Contract Time, or both, to the Sheriff's Fiscal Director. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents or are not materially different from those ordinarily found and that no change in the terms of the Contract is justified, the Sheriff's Office shall notify the Contractor in writing. However the Work shall be performed after direction is provided by the Architect.

3) Contractor shall ascertain such conditions, as described in B) 1) above, as may be readily determined by inspection and inquiry, such as the location, accessibility and general character of the site prior to submitting a bid proposal.

C) Existing Utilities: Information shown on the Drawings as to the location of existing utilities has been prepared from the most reliable data available to the Hillsborough County Sheriff's Office. Prior to commencing work the Contractor shall be responsible for verification and location of utilities. The Sheriff's Office will not be liable for any damage or delay caused by any utility line that was identified or could have been identified using reasonable means. If Contractor fails to fulfill its due diligence investigation, obligations, or negligently conducts the due diligence investigations with respect to existing utilities prior to the commencement of Work, Contractor will be deemed to have waived any claim it might otherwise have had in an adjustment to the Contract Price or Contract Time. If Contractor fully performs its due diligence investigation obligations with respect to existing utilities, prior to the commencement of Work, and Contractor is subsequently delayed by an unknown existing utility conflict, the Contractor may make a claim for any extension to the Contract Time in accordance with the requirements of this Contract, but in no event will the Contractor be entitled to any damages or overhead compensation from the Sheriff's Office.

24. CONTRACTOR'S RESPONSIBILITIES

A) Supervision and Superintendence: The Contractor will supervise and direct the Work efficiently and with his best skill and attention. He will be solely responsible for the means, methods, techniques, sequences, and procedures of construction unless specifically addressed in the Contract Documents. The Contractor will be responsible for seeing that the finished Work complies accurately with the Contract Documents. The Contractor will cooperate with and be responsible for coordination of the Work with other contractors and/or utilities at the site.

The Contractor will keep a competent resident superintendent at the job site at all times during the Work progress who shall not be replaced without written notice to the Project Manager except under extraordinary circumstances. The Superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor.

B) Labor, Materials, and Equipment: The Contractor will provide and pay for competent, suitable, qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. He will at all times maintain good discipline and order on the site.

The Contractor will furnish and pay for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals whether temporary or permanent necessary for the execution, testing, initial operation, and completion of the Work as required by the Contract Documents.

All materials and equipment will be new and of good quality, except as otherwise provided in the Contract Documents. If required by the Buyer, the Contractor will furnish satisfactory evidence as to the kind and quality of materials and equipment.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processors, except as otherwise provided in the Contract Documents.

C) Substitute Materials or Equipment: If the Contractor wishes to furnish or use a proposed substitute, he will, after the award of the Contract, make written application to the Architect for approval of such substitute, certifying in writing that the proposed substitute will perform adequately the duties imposed by the general design, be similar and of equal substance or quality to that specified, and be suited to the same use and capable of performing the same function as that specified. No substitute shall be ordered or installed without the prior written approval of the Architect, who shall be the sole judge of acceptability. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign, delays and claims of other Contractors affected by the resulting change, all of which shall be considered by the Architect in evaluating the proposed substitute. Approval of any change in costs or schedule as result of acceptance of the substitute by the Architect will be by Change Order.

D) Concerning Subcontractors: The Contractor will be fully responsible for all acts and omissions of his subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent as if they were employed by him. Nothing in the Contract Documents shall create any contractual relationship between any subcontractor and the Sheriff's Office or any obligation on the part of the Sheriff's Office to pay or to see to the payment of any monies due

any subcontractor, except as may otherwise be required by law. The Sheriff's Office may furnish to any subcontractor, to the extent practicable, evidence of amounts paid to the Contractor for specific Work done.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing Work among subcontractors or delineating the Work to be performed by any specific trade. **The Contractor agrees to bind specifically every subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the Sheriff's Office.**

All work performed for the Contractor by a subcontractor shall be pursuant to an appropriate written agreement between the Contractor and the subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance, except such rights as they may have to the proceeds of such insurance held by the Sheriff's Office as trustee. The Contractor will pay each subcontractor an appropriate amount determined by value of the Work, of any insurance monies received by the Contractor under this insurance.

E) Patent Fees and Royalties: The Contractor will pay all license fees and royalties and assume all costs incident to the use of any invention, design, process, or device which is the subject of patent rights or copyrights held by others.

F) Permits: The Contractor will secure and pay for construction permits and licenses and will pay all governmental charges and inspections fees which are applicable and necessary for the execution of the Work at the time of his Bid. Any delays associated with the permitting process will be considered for time extensions only and no damages or additional compensation for delay will be allowed.

G) Laws and Regulations: The Contractor will give notices and comply with all laws, ordinances, rules, codes and regulations applicable to the Work. If the Contractor observes that any of the Contract Documents are contradictory to such laws, rules, and regulations, he will notify the Architect promptly in writing. Any necessary changes will then be adjusted by an appropriate Change Order. If the Contractor performs any Work that it knows or should have known to the contrary of such laws, ordinances, rules, codes, and regulations and without such notice to the Architect, he will bear all related costs.

H) Use of Premises: The Contractor will confine his equipment, the storage of materials and equipment, and the operations of his workers to the areas permitted by law, ordinances, permits, or the requirement of the Contract Documents. He shall not unreasonably encumber the premises with materials and equipment. Any loss or damage to the Contractor's or any subcontractor's equipment is solely at the risk of the Contractor.

The Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger them.

I) Record Drawings: The Contractor will keep at the site and in good order one record copy of the Contract Documents, including but not limited to all Specifications, Drawings, Addenda, Modifications and Shop Drawings. These documents will be annotated to show all changes made during the construction process. These shall be available to the Project Manager and the Architect.

J) Safety: The Contractor will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of an will provide necessary protection to prevent damage, injury, or loss to:

All employees on the Work and other persons who may be affected by it;

All the Work and all materials or equipment to be incorporated, whether in storage on or off the site;

Other property at the site or adjacent to it, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, codes regulations, and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. Contractor will notify owner of adjacent property and utilities when execution of Work may affect them prior to start of work. All damage, injury, or loss to any property caused directly or indirectly, in whole or in part by the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable will be remedied by the Contractor.

K) Emergencies: In emergencies affecting the safety of persons, the Work or property at the site or adjacent thereto, the Contractor, without special instructions or authorization from the Architect if time or circumstances do not permit, is obligated to prevent threatened damage, injury, or loss. Contractor will give the Architect written notice that the emergency provision has been invoked and shall state the reasons therefore within twenty four (24) hours of the incident. If the Contractor believes the emergency resulted in additional Work, a claim for a Change Order is permissible.

The Contractor shall immediately notify the Project Manager of all events involving personal injuries to any person on the site, whether or not such person was engaged in the construction of the Project, and shall file a written report on such person(s) and any other event resulting in property damage of any amount within five (5) calendar days of the occurrence.

L) Submittals and Samples: After checking and verifying all field measurements, the Contractor will submit to the Architect for approval, the proper number of submittals in accordance with Technical Specifications, which shall have been checked by and stamped with the approval of the Contractor and identified as the Architect may require. The data shown on or with the submittals will be complete with respect to dimensions, design criteria, materials of construction, and the like to the enable the Architect to review the submittal as required.

The Contractor will promptly submit to the Architect for approval all submittals and samples required by the Contract Documents. All submittals and samples will have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent numbers, and the intended use. At the time of each submission, the Contractor will notify in writing the Architect as to any deviations that the submittals or sample may have from the requirements of the Contract Documents.

The Architect will review and approve submittals and samples. The Architect's review and approval shall be only for conformance with the design concept of the Project and compliance with information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. The Contractor will make any corrections required by the Architect and return the required number of corrected copies and resubmit until approved. The Contractor's stamp of approval on any submittal or sample shall constitute a representation to the Architect and the Sheriff that the Contractor has determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that each submittal or sample has been reviewed or coordinated with the requirements of the Work and the Contract Documents.

No Work requiring a submittal or sample submission shall commence until the submission has been approved by the Architect. A copy of each approved submittal and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Architect and other designated Sheriff's Office personnel. Any delays associated with the submittal process will be considered for time extensions only, and no damages or additional compensation for delay will be allowed.

The Architect’s approval of submittals and samples shall not relieve the Contractor of his responsibility for any deviations from the requirements of the Contract Documents unless the Contractor has called the Architect attention to such deviation in writing at the time of submission and the Architect has given written approval to the specific deviation; nor shall any approval by the Architect relieve the Contractor from responsibility for errors or omissions in the submittals.

To facilitate review, the Contractor shall number consecutively each submittal. This numbering system shall be in order of submittal. Any resubmittal required shall have the same number as the original submittal followed by notation signifying that this is a second or third submittal, (e.g. #14 2nd submittal). All submittals will provide a space for the Architect's review stamp, preferably on the first page. In addition all submittals shall contain the following notation placed by the Contractor:

Project Number and Name:_____
Submittal Number:_____
Deviations:_____
None:_____
As listed:_____
Reference Specification Number:_____

Reference Drawing Number:_____
Space Requirement:_____
As designed:_____
Different as listed:_____
Contractor has reviewed and submitted for approval.
Signature:_____
Date:_____

The review of a particular submittal will be undertaken only if the above such information is provided.

M) Cleaning Up: The Contractor will maintain the premises from accumulations of waste materials, rubbish, and other debris resulting from the Work on a daily basis or as required. At completion of the Work, he will remove all waste materials, rubbish and debris from the premises as well as all tools, construction equipment and machinery, and surplus materials and will leave the site clean and ready for occupancy by the Sheriff's Office. In addition to any other rights available to the Sheriff's Office under this Contract, the Contractors failure to maintain the site may result in withholding of any amounts due Contractor. The Contractor will restore to original condition those portions of the site not designated for alteration by the Contract Documents.

25. WORK BY OTHERS

The Sheriff's Office may perform additional work related to the Project with its own forces or may let other direct contracts. The Contractor will provide the other contractors who are parties to such direct contracts, including but not limited to the other contractors, employees, agents, subcontractors and suppliers (or the Sheriff's Office forces performing the additional work), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate his Work with theirs. The Contractor is not entitled to exclusive use of the site.

If any part of the Contractor's Work depends (for proper execution or results) upon the work of any such other contractor (or the Sheriff's Office staff), the Contractor will inspect and promptly report to the Project Manager in writing of any defects or deficiencies in such work that render it unsuitable for such proper execution and results. Contractor's failure to report shall constitute an acceptance of the other work, except as to defects and deficiencies which may appear in the other work after the execution of his Work. Contractor shall be entitled to extension of time, but not to damages or additional compensation related to delay caused by such other contractor.

The Contractor will do all cutting, fitting, and patching of his Work that may be required to make its several parts come together properly, and fit it to receive or be received by such other work. The Contractor will not endanger any work of others by cutting, excavating, or otherwise altering such other work and will only cut or alter such other work with the written consent of the Project Manager, and if such alteration will not increase the cost or time of the Contract.

If the performance of additional work by other contractors or the Sheriff's Office is not noted in the Contract Documents prior to the execution of the contract, written notice shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the Sheriff's Office or others involves additional expense or entitles him to an extension of the Contract Time, he may make a claim.

26. INVOICING AND PAYMENTS

It is a requirement of the **SHERIFF'S OFFICE** to have the **ARCHITECT's** review and approve all invoices prior to the **SHERIFF'S OFFICE** paying invoices. The **CONTRACTOR** will submit application for payment documents to the **ARCHITECT** prior to submitting an actual invoice to the **SHERIFF'S OFFICE**. All invoices submitted to the **SHERIFF'S OFFICE** will have a copy of the application attached indicating the **ARCHITECT** approval.

All invoices shall be NET/45 from the date of receipt at the Sheriff's Office Fiscal Bureau. The applications and invoices shall show: Location of service; Service performed; Percentage of completion; Period of time service performed; purchase order number unit prices and extended prices. All applications and invoices shall be accompanied with schedule of values and indicate amount of work completed as of the application date. Applications and invoices shall be accompanied by Waivers of Liens from the contractor, all subcontractors, and all suppliers of equipment and materials. All progress payments will be subject to a ten (10%) retainage which will be reimbursed with the final payment after acceptance by the Hillsborough County Sheriff's Office.

Architect:	Ranon & Partners Inc. Mr. John Ranon 515 Bay St. Ste. 200 Tampa, Fl 33606-2796	Sheriff: Hillsborough County Sheriff's Office Attention: Fiscal Bureau P.O. Box 3371 Tampa, FL 33601

27. BID OPENING

At bid opening, bidders names and unit prices will be read aloud. The bid summary sheet will not be available until all tabulations have been reviewed, verified and an award has been approved or within ten (10) days after the opening date, whichever is earlier.

28. VENDOR INQUIRIES

Vendors shall examine the invitation to bid to determine if the Sheriff's Office requirements are clearly stated. If there are any requirements which restrict competition, the vendor may request, in writing, that the specifications be changed. Vendors who request changes to specifications must identify and describe, in detail, why they would have difficulty in meeting the specifications, must provide detailed justification for change, and must provide recommended changes to the specifications. Questions concerning conditions and specifications and/or requests for changes must be received in writing by the Fiscal Bureau no later ten (10) days prior to the bid opening date. A vendor's failure to request changes by the time indicated above shall be considered to constitute the vendor's acceptance of the specifications. The Sheriff's Office shall determine what changes to the invitation to bid shall be acceptable. If required, the Sheriff's Office shall issue an addendum reflecting the acceptable changes to the invitation to bid. The addenda shall be sent to all bidders who were furnished a copy of the bid document to insure that all vendors shall be given the opportunity of submitting bids to the revised specifications. In the event addenda are required, they will be published as soon as reasonably practicable after receipt of change request.

29. DISPUTES

Any prospective bidder who disputes the reasonableness or appropriateness of the terms and conditions, special conditions and/or specifications of the bid document, any addendum, notice of award or notice of rejection for any or all bids, shall file a notice of intent to protest, in writing, within 72 hours (excluding official holidays, Saturdays and Sundays) of the receipt of the bid document or notification and a formal written protest in accordance with Florida Administrative Code Rule 60-4.012 within ten (10) calendar days thereafter. Failure to file within the time stipulated constitutes a waiver of proceedings as prescribed by Florida Statute 120. The ten day period includes official holidays, Saturdays and Sundays. If the tenth day should fall on an official holiday, Saturday or Sunday, then the period shall extend until the end of the next regular work day.

Any person who files an action protesting a decision or intended decision pertaining to contracts administered by the Sheriff's Office shall post with the formal protest, a bond in accordance with Florida Statute 287.042 (2) (c) payable to Cal Henderson, Sheriff in an amount equal to 1 percent (1%) of the Sheriff's Office estimate of the total volume of the contract or $5,000, whichever is less. In lieu of a bond, the Sheriff's Office may accept a cashier's check or money order in the amount of the bond.

30. EXCEPTIONS TO BID

All bid submittals must clearly state with specific detail all deviations to the requirements imposed upon the Bidder by the General Terms and Provisions (Part A), the Special Provisions (Part B), the Special Conditions of Contract (Part C), the Technical Specifications (Part D) and the Attachment Drawings. Such deviations should be stated upon the Bid Proposal (Part E) or appended thereto. Bidders are hereby advised that the Hillsborough County Sheriff will only consider bid proposals that meet the specifications and other requirements imposed upon them by this bid package. In instances, where an exception is stated upon the Bid Proposal (Part E), said bid proposal will be subject to rejection by the Hillsborough County Sheriff in recognition of the fact that said bid proposal does not meet the exact requirements imposed upon the Bidder by the General Terms and Provisions (Part A), the Special Provisions (Part B), the Special Conditions of Contract (Part C), and the Technical Specifications (Part D) and the Attachment Drawings.

PART C - SPECIAL CONDITIONS OF CONTRACT

1.0 SCOPE

These Special Conditions modify or supplement the Special Provisions and other conditions of the Contract document. To the extent such provisions remain in full force and effect. This project will be offered for bid in accordance with Part D - Technical Specifications, Drawings and related sections.

2.0 SUMMARY OF WORK

Morgan Street Jail - Built-Up Coal Tar Bituminous Roofing System

A. The work includes, but is not limited to the following: (1) removal of existing built-up roof, existing flashings and installation of new coal tar pitch built-up roof, new flashings, new, curb(s) as per specifications and drawings provided for this roof system; (2) replacement of three roof-top HVAC units, revisions and relocations to related piping as indicated on the Drawings, new control and shut off valves and other appurtenances; (3) electrical work required in the replacement of HVAC units.

3.0 IDENTIFICATION AND RESPONSIBILITIES

3.1 Identification of Project Manager

The **PROJECT MANAGER** for the Project is identified as the representative of the Sheriff's Office. The **PROJECT MANAGER** may assign additional responsibilities to his designated representative(s) at the jail, representatives names will be furnished at the Pre-Construction meeting.

PROJECT MANAGER:	**Junior Baldarama** **Morgan Street Jail** **1301 N. Morgan St., Tampa** **Ph. (813) 247-8426 or 8425**
ARCHITECT:	**John Ranon** **Ranon & Partners Inc.** **515 Bay St., Tampa** **Ph. (813) 253-3465**

4.0 CONTRACTOR WORK REQUIRED EXPERIENCE

4.1 The **CONTRACTOR** shall have at least five (5) years experience in work similar in scope and magnitude to this Project. At the time of Bid opening, and upon request of the **SHERIFF's OFFICE (SHERIFF)**, the **CONTRACTOR** shall submit a list of successfully completed projects and references for verification.

5.0 COORDINATION

5.1 The **CONTRACTOR** shall coordinate all the WORK and the WORK of the suppliers and subcontractors other works with **SHERIFF's PROJECT MANAGER.**

5.2 The **CONTRACTOR** shall schedule and perform the work in such a manner as to result in the least possible disruption to normal operation of on-site Sheriff's Office activities.

A. The Contractor shall develop a schedule indicating the proposed phasing of the work which shall be submitted to and approved by the Sheriff’s Office, before construction is started.

6.0 SUBMITTALS, PRE-QUALIFICATIONS AND RESPONSIBILITIES OF CONTRACTOR

6.1 Bidders shall provide the following information with their bid package:

A. Provide proof of either State of Florida and/or Hillsborough County Licensed Roofing Contractor certification with bid proposal or within 48 hours of notification by the Sheriff's Office that such has not been provided.

B. Evidence that the Bidder has at least five (5) years of successful experience in installation of built-up roofing systems and HVAC units similar to that required for this project.

C. A list of all Subcontractors, material suppliers and all other such persons and organizations whom the Contractor intends to utilize in performing portions of the Work.

D. Evidence from the manufacturer of primary products that the Bidder is approved by the manufacturer for installation of the specific roofing system.

F. Sample of the roofing and HVAC units manufacturer's guarantee/warranty which meets the requirements of the specification.

6.2 Wherein the Contract Documents call for shop drawings or other submittal to be submitted to **ARCHITECT, CONTRACTOR** shall submit all shop drawings and other submittals to the **ARCHITECT** for review.

6.3 Within **ten (10)** calendar days after the Notice to Proceed date, the Contractor shall submit to the Architect, for review and acceptance, a preliminary progress schedule covering the activities of work during the course of the Contract. The schedule shall also include, start and completion dates for the various stages of the Work, a preliminary schedule of submittals, and a preliminary schedule of values of the Work. The preliminary schedules will be superseded by final schedules as called for in the Specifications.

6.4 The Sheriff's Office shall issue all communications to the Contractor through the Architect except for authorization required by Change Order pursuant to this Contract.

In connection with the Sheriff's request for changes in the Work, the Sheriff's Office Fiscal Director shall execute the appropriate Change Orders for such changes upon approval by the Architect and the Project Manager.

6.5 Owner desires Contractor to prosecute work diligently, and to complete the entire work ready for use within one hundred and sixty (160) calendar days from the date of the Notice to Proceed. The time stated for completion shall include final cleanup of premises.

A) The following anticipated number of unfavorable weather days for each month has been incorporated into contract time. However, if there is any time extension required for unforeseen conditions or unfavorable weather days other than the following, CONTRACTOR is required to submit proper documentation to the ARCHITECT for approval by the PROJECT MANAGER for time extension consideration.

January	2 work days	July	7 work days
February	3 work days	August	7 work days
March	3 work days	September	6 work days
April	2 work days	October	2 work days
May	3 work days	November	2 work days
June	5 work days	December	2 work days

7.0 TEMPORARY UTILITIES

7.1 The **CONTRACTOR** may use the existing on-site utilities (electrical, water and sanitary utilities) for construction work. **CONTRACTOR** shall coordinate such use with on-site Sheriff's representative.

7.2 The **CONTRACTOR** is responsible to return all the utilities to their original state.

8.0 SAFETY

8.1 Job site safety is the **CONTRACTOR's** responsibility. Appropriate first aid facilities and supplies shall be kept and maintained by the **CONTRACTOR** at the site of the WORK. All persons within the construction area shall be required to wear protective helmets. In addition, all employees of the **CONTRACTOR** and its subcontractors shall be provided with, and required to use, personal protective and life saving equipment as set forth in Subpart E of the OSHA Standards for Construction (29 CFR 1926).

8.2 During the performance of the work, **CONTRACTOR** shall erect and maintain temporary protective barriers and take all other necessary precautions and place proper guards and warning signs for the prevention of accidents. **CONTRACTOR** shall erect and maintain suitable and sufficient lights and other signals.

9.0 ENVIRONMENTAL CONTROLS The cost of all environmental controls shall be at the **CONTRACTOR's** expense.

9.1 During the progress of the work, **CONTRACTOR** shall keep the site of the work and other areas used by **CONTRACTOR** in a neat and clean condition and free from any accumulation of trash and debris and other materials resulting from demolition operation. **CONTRACTOR** shall dispose of all trash and debris and waste materials of any nature occurring at the work site and establish regular intervals of collection and disposal of such materials and waste. **CONTRACTOR** shall also keep haul and parking lot roads free from dirt, rubbish, and unnecessary obstructions resulting from **CONTRACTOR's** operations. Equipment and material storage shall be confined to areas approved by the **PROJECT MANAGER.** Disposal of all trash, debris and surplus materials shall be off the site of construction at the **CONTRACTOR's** expense, all in accordance with local codes and ordinances governing locations and methods of disposal, in conformance with all applicable safety laws, and to the particular requirements of **Subpart H. Section 1926.252 of the OSHA Standards for Construction**.

9.2 Chemicals: If chemicals are used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, they shall be as approved by the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

9.3 Material Safety Data Sheets (MSDS's) as required by OSHA shall be submitted directly to the Owner prior to use of materials on the Project.

10.0 MOBILIZATION

10.1 Definition and Scope:

A. Mobilization shall include the obtaining of all permits, insurance, and bonds; moving onto the site of all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities; all as required for the proper performance and completion of the WORK. Mobilization shall include, but not be limited to, the following principal items:

1. Move onto the site all **CONTRACTOR's** plant and equipment required for first month operations.
2. Obtain all required permits.
3. Post all OSHA, EPA, Department of Labor, and all other required notices.
4. Provide on-site potable water facilities as required.
5. Have **CONTRACTOR's** superintendent at the job site full time.
6. Submit a detailed construction schedule acceptable to the **SHERIFF** as specified.
7. Submit a finalized schedule of values of the WORK in the **SHERIFF's** approved format.
8. Submit a finalized schedule of submittals.

10.2 Payment for Mobilization:

A. The **CONTRACTOR's** attention is directed to the condition that no payment for mobilization, or any part thereof, will be approved for payment under the CONTRACT until all mobilization items listed above have been completed as specified.

11.0 RECORD DOCUMENT DRAWINGS

11.1 **CONTRACTOR** shall maintain record drawings in accordance with the Contract Document.

11.2 The **CONTRACTOR** shall keep and maintain at the job site one set of contract documents and drawings in good legible condition. On these, the **CONTRACTOR** shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings. All repair work locations must be marked indicating type of work accomplished. Said record drawings shall be supplemented by any detailed sketches or typewritten changes to the specifications, as necessary or directed to indicate fully the **WORK** as actually constructed. These master record drawings of the **CONTRACTOR's** representation of as-built conditions, including all revisions made necessary by addenda, change orders, and the like shall be maintained up-to-date during the progress of the **WORK.**

11.3 Record drawings shall be accessible to the **PROJECT MANAGER** and the **ARCHITECT** at all times during the construction period and shall be delivered to the **ARCHITECT** upon completion of the **WORK** prior to final acceptance of project.

11.4 The **ARCHITECT** will provide to the **CONTRACTOR** a reproducible set of plans for the **CONTRACTOR's** use for creation of a reproducible set of as-built record drawings. All as-built information shall be transferred to the reproducible drawings after construction completion.

11.5 Minimum as-built conditions must be noted as follows:

A. All changes and significant deviations from the original design plans must be included. Must be neat and legible. All deviations must be highlighted on the record drawings using a "cloud".

12.0 CLOSEOUT

12.1 The **CONTRACTOR** shall comply with the Closeout requirements of the Contract Documents.

12.2 Completion Procedures:

A. When the **CONTRACTOR** believes Substantial Completion has been achieved, the **CONTRACTOR** shall request, in writing, to the **ARCHITECT**, that Substantial Completion be

recognized as having been achieved and request that the **ARCHITECT** issue a Certificate of Substantial Completion.

B. Prior to making such a request, the **CONTRACTOR** must have:

1. Completed all work necessary for the safe, proper and complete use of the facility.

2. Prepared a **CONTRACTOR** generated punch list for submission with the request for issuance of a Certificate of Substantial Completion.

C. Upon receipt of the request from the **CONTRACTOR**, the **ARCHITECT** shall review the request, the WORK and the above requirements to determine whether the **CONTRACTOR** has achieved Substantial Completion. If this review fails to support Substantial Completion, the **ARCHITECT** shall so notify the **CONTRACTOR** in writing citing the reasons for rejection. If the **ARCHITECT** determines the **CONTRACTOR** has reached Substantial Completion, the following procedures will be followed:

1. The **ARCHITECT**, his/her representative will review the WORK and the **CONTRACTOR'S** punch list to assure all deficiencies are noted on a final punch list.

2. The **ARCHITECT** will schedule and conduct a pre-final walk-through of the facility with the **PROJECT MANAGER**, the **CONTRACTOR** and others, for the purpose of formally reviewing the WORK, the final Punch List and the readiness of the Project for use. A copy of the final Punch List will be provided to all participants and any additional items noted during the walk-through will be added to the list.

D. Final Completion will be deemed to have occurred when all Work is completed including the following:

Final inspection will be accomplished by the Architect and Project Manager or designated representatives. It will be determined at that time if all conditions of the service have been met. The Contractor, at that time, will have policed the surrounding building and grounds to insure a clean condition exists.

Final acceptance will be given after all inspections are satisfied and when all Work required under the Contract Documents have been satisfactorily completed, including but not limited to:

1. All final Punch List items have been corrected, signed off by the **CONTRACTOR** , the **ARCHITECT** and the **PROJECT MANAGER'S** representative, and demonstrated to the **SHERIFF OFFICE** during a final walk through.

2. All updates to the Record Documents have been made and accepted by the **ARCHITECT**.

3. Demobilization and site clean up are complete.

4. The **ARCHITECT** has issued a Certificate of Final Completion.

5. Executed release of lien by the Contractor with executed supporting documents has been received.

6. Release of lien by all Sub-contractors and material suppliers has been received.

7. Executed Consent of Surety for Final Payment has been received.

8. List of all Sub-Contractors, addresses, telephone numbers and name of person responsible for the WORK has been received.

E. Warranty/Guarantee periods will commence at the issuance of the Certificate of Substantial Completion.

12.3 Closeout Procedures:

A. **ARCHITECT** and **CONTRACTOR** shall meet and resolve all outstanding issues including, but not limited to:

1. Claims and adjustments for time or costs

2. Outstanding, unused allowance

3. Procedures for handling warranty issues

B. A Final Change Order shall be processed if required. Final payment and close out procedures shall comply with Invoicing and Payments, review of payments by ARCHITECT and all other requirements of the **CONTRACT DOCUMENTS**.

13.0 PERMITS

A. The **CONTRACTOR** shall be responsible for obtaining and paying for 100% of all permits, fees, and licenses required for performing the work of the Contract.

14.0 LIQUIDATED DAMAGES

A. Bidders are hereby advised that liquidated damages at the rate specified shall be assessed against the successful Bidder not complying with a stated delivery/performance time. Failure to complete the work in the time period provided with the bid submittal shall result in an assessment of liquidated damages fee for each calendar day this work remains incomplete. Deduction to be made from Contractor's final pay.

Liquidated damages for each calendar day that each Milestone Date is not met are as follows:

Milestone	Calendar Days from Notice to Proceed Of the Corresponding Milestone	Amount of Liquidated Damages
Substantial Completion	160	$250.00
Final Completion	175	

15.0 PRODUCTS DELIVERY, STORAGE, HANDLING AND STOCK PILING OF MATERIALS & ON-SITE STORAGE

15.1 **CONTRACTOR** shall deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. **CONTRACTOR** shall submit to the **PROJECT MANAGER** copies of all manufacturers' written recommendations regarding the same. Delivery schedules shall be controlled to minimize long-term storage at the site and to prevent overcrowding of construction spaces. In particular, **CONTRACTOR** shall provide

delivery/installation coordination to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and sources of loss.

15.2 During the performance of the work, **CONTRACTOR** shall not stock pile the construction materials on the roof in such a manner as to create an unsafe condition by adding a concentrated load on the roof structure.

15.3 Minimum storage will be allowed on-site. **CONTRACTOR** shall coordinate with and request approval from the **PROJECT MANAGER** prior to transporting and delivery of materials.

15.4 Staging area to be determined at the Pre-Construction meeting. CONTRACTOR shall be responsible for safety and security of all equipment in staging area.

16.0 PROTECTION OF BUILDING & SITE

The **CONTRACTOR** shall be responsible for protecting the building, contents, components and the sidewalk or driveways from water damage, leak and bitumen spots. The **CONTRACTOR** shall prune trees away from roof if required for installation or safety and provide required access protection for all staff and visitors during use of the building.

17.0 SCHEDULE OF VALUES

A. **CONTRACTOR'S** Schedule of Values shall be prepared, submitted, reviewed, monitored and approved in accordance with the following.

B. Within ten (10) calendar days after Notice of Award of the contract, but not later than the pre-construction meeting, the **CONTRACTOR** shall prepare and submit to **ARCHITECT** a schedule of values covering each lump sum item. The schedule of values showing the value of each kind of work shall be acceptable to **ARCHITECT** before any partial payment estimate is prepared. Such items as Bond premium, temporary construction facilities, and plant may be listed separately in the schedule of values, provided the amounts can be substantiated.

C. The sum of the items listed in the schedule of values shall equal the contract lump sum price. Overhead and profit shall not be listed as separate items in the schedule of values.

D. An unbalanced schedule of values providing for overpayment of **CONTRACTOR** on items of WORK which would be performed first will not be accepted. The schedule of values shall be revised and resubmitted until acceptable to **ARCHITECT**.

18.0 QUALITY CONTROL

18.1 Site Investigation and Control:

A. **CONTRACTOR** shall check and verify all dimensions and conditions in the field continuously during construction. **CONTRACTOR** shall be solely responsible for any inaccuracies built into the WORK due to **CONTRACTOR's** failure to comply with this requirement.

B. **CONTRACTOR** shall inspect related and appurtenant WORK and report in writing to **ARCHITECT** any conditions which will prevent proper completion of the WORK. Failure to report any such conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the **CONTRACTOR** solely and entirely at **CONTRACTOR's** expense.

18.2 Inspection of the Work:

A. All work performed by the **CONTRACTOR** shall be inspected by the **CONTRACTOR** and nonconforming WORK shall be noted and promptly corrected. The **CONTRACTOR** is responsible for the WORK conforming to the Contract Documents.

B. The WORK shall be conducted under the general observation of the **ARCHITECT** and is subject to inspection by representatives of the **SHERIFF** to ensure compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection as required. The **ARCHITECT,** or any inspector(s) shall be permitted access to all parts of the WORK, including plants where materials or equipment are manufactured or fabricated.

C. The presence of the **ARCHITECT** and or the **PROJECT MANAGER**, or any inspector(s), however, shall not relieve the **CONTRACTOR** of the responsibility for the proper execution of the WORK in accordance with all requirements of the Contract Documents. Compliance is the responsibility of the **CONTRACTOR.** No act or omission on the part of the **ARCHITECT,** or any inspector(s) shall be construed as relieving **CONTRACTOR** of this responsibility. The **SHERIFF** may accept non-conforming WORK when adequate compensation is offered and it is in the **SHERIFF's** best interest as determined by the **SHERIFF.**

18.3 Sampling and Testing:

A. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered. However, the **ARCHITECT** reserves the right to use any generally accepted system of inspection which, in the opinion of the **ARCHITECT** will ensure the **ARCHITECT** that the quality of the workmanship is in full accord with the Contract Documents.

B. The **SHERIFF** reserves the right to waive tests or quality assurance measures, but waiver of any specific testing or other quality assurance measure, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the **SHERIFF** shall reserve the right to make independent investigations and tests as specified in the following paragraph and failure of any portion of the WORK to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the **SHERIFF** to require the removal or correction and reconstruction of any such WORK.

D. In addition to any other inspection or quality assurance provisions that may be specified, the **SHERIFF** shall have the right to independently select, test, and analyze, at the expense of the **SHERIFF**, additional test specimens of tests and analyses shall be considered to determine compliance with the applicable specifications for the materials so tested or analyzed provided that wherever any portion of the WORK is discovered, as a result of such independent testing or investigation by the **ARCHITECT**, which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such WORK shall be borne by the **CONTRACTOR.**

18.4 Right of Rejection:

A. The **ARCHITECT** or designated representative, acting for the **SHERIFF,** shall have the right at all times and places to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the WORK at the site. If the **ARCHITECT** or designated representative, through an oversight or otherwise, has accepted materials or WORK which are defective or in any way contrary to the Contract Documents, such materials, no matter in what stage or condition of manufacture, deliverance, or erection, may be rejected.

B. **CONTRACTOR** shall promptly remove or replace rejected articles or materials from the site of the WORK after notifications of rejection.

C. All costs of removal and replacement of rejected articles of materials, as specified herein, shall be borne by the **CONTRACTOR.**

19.0 PROTECTION OF EXISTING UTILITIES

19.1 **CONTRACTOR** shall protect all existing improvements not designated for removal and restore damaged improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements specified herein, and in accordance with the requirements of the Contract Documents.

19.2 **CONTRACTOR** shall protect all improvements which may be impaired during construction operations. It shall be **CONTRACTOR's** responsibility to ascertain the actual location of improvements indicated on the drawings that will be encountered during construction, and to see that such improvements are adequately protected from damage due to such operations.

20.0 OWNER OCCUPANCY OF BUILDING

20.1 The owner will occupy the site and the existing building during the entire work on a 24-hour basis. Sheriff's Office Project Manager's and engineering staff will be available from 7:00 A.M. to 5:00 P.M.. **CONTRACTOR** may be permitted to work outside of these operating hours (including weekends) provided he coordinates in advance the **PROJECT MANAGER**. If the **CONTRACTOR** desires to work outside of normal operational hours (including weekends) the **CONTRACTOR** shall not be entitled to additional monetary compensation or time.

20.2 CONTRACTOR shall pay attention to protect existing fresh air intakes on the roof where the work is to be performed. The CONTRACTOR shall safeguard the migration of fumes into the building.

20.3 The CONTRACTOR shall take all precautions to protect existing building, pavements, landscaping, utilities and equipment during construction and at staging areas. Any damage sustained to the facilities and grounds shall be repaired at CONTRACTOR'S expense.

21.0 SITE VISIT

21.1 A "Site Visit" will be held immediately following the pre-bid conference. Before submitting the bid proposal, bidders shall fully inform themselves as to all existing conditions and limitations, and shall include in their bid proposal a sum to cover the cost of the entire work and any Alternate Bid Price requested. No consideration will be given to any claim based on lack of knowledge of existing conditions, except where

the Contract Documents make definite provisions for adjustment of cost or extension of time due to existing conditions which cannot be readily ascertained.

22.0 DEFINITION

22.1 **SHERIFF** may mean the HILLSBOROUGH COUNTY SHERIFF'S OFFICE acting by and through its authorized designees, agents and employees.

23.0 INSPECTION BY PUBLIC AGENCIES

23.1 Authorized representatives of any Regulatory Agency shall have access to the Work wherever it is in preparation or progress. **CONTRACTOR** shall provide proper facilities for such access and inspection.

END OF SPECIAL CONDITIONS

SECTION 07512 - BUILT-UP COAL-TAR ROOFING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General Terms and Provisions, Special Provisions, Special Conditions of Contract and Technical Specifications.

SUMMARY

The extent of the built-up roofing system work (BUR) required is indicated on the Drawings and by provisions of this Section, and is defined to include roofing, insulation immediately under roofing, composition flashing and stripping and roofing accessories integrally related to installation of roofing.

This Section includes but is not limited to the following:

Removal and replacement of existing metal gravel stops and metal flashings.

Removal and replacement of existing roof coverings.

Removal and replacement of existing bituminous flashings.

Removal and replacement of existing roof insulation.

Removal and replacement of existing roof expansion joint.

Removal and replacement of existing penetration pockets (pitch pans).

Removal and replacement of existing walkways.

There may be roofing materials that contain asbestos in areas where the roof is being replaced. This Contractor shall be responsible for the removal and disposal of asbestos-containing materials by a contractor certified to perform such work. All materials shall be disposed of in compliance with state and local codes requirements.

Related Sections include the following:

Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.

Division 7 Section "Joint Sealants."

Division 15 Section "Plumbing Specialties" for roof drains.

DEFINITIONS

Roofing Terminology: Refer to ASTM D 1079 for definitions of terms related to roofing work not otherwise defined in this Section.

Bitumen: A generic term used in this Section to include either asphalt or coal-tar pitch for roofing applications.

Hot Coal-Tar Pitch: Coal-tar pitch heated to its equiviscous temperature, the temperature at which its viscosity is 25 centipoise for either mopping or mechanical application within a range of plus or minus 25 deg F (14 deg C) measured at the mop cart or mechanical spreader immediately before application.

Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt within a range of plus or minus 25 deg F (14 deg C) measured at the mop cart or mechanical spreader immediately before application.

PERFORMANCE REQUIREMENTS

General: Install a watertight, built-up roofing and base flashing roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.

FM Listing: Provide built-up roofing, base flashings, and component materials that comply with requirements of FM 4450 and FM 4470 as part of a roofing system and that are listed in FM's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM markings.

Roofing system shall comply with the following:

Fire/Windstorm Classification: Class 1A-90.

SUBMITTALS

Product Data: For each type of roofing product specified. Include data substantiating that materials comply with requirements.

Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install specified roofing system and is eligible to receive the standard roofing manufacturer's warranty.

Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with requirements specified in the "Performance Requirements" Article. On request, submit evidence of complying with requirements.

Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.

Warranty: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.

Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

QUALITY ASSURANCE

Installer Qualifications: Engage an experienced installer to perform Work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive the standard roofing manufacturer's warranty.

Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another

testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.

Preinstallation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Notify participants at least 5 working days before conference.

Meet with Owner; Architect; roofing Installer; roofing system manufacturer's representative.

Review methods and procedures related to roofing installation, including manufacturer's written instructions.

Examine deck substrate conditions and finishes for compliance with requirements, including flatness and attachment to structural members.

Review loading limitations of deck during and after roofing.

Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.

Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.

Review roof observation and repair procedures after roofing installation.

DELIVERY, STORAGE, AND HANDLING

Store roofing materials in a dry, warm, well-ventilated, weathertight location according to roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.

Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.

Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F (10 deg C).

Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

Protect roofing insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

PROJECT CONDITIONS

Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed according to manufacturers' written instructions and warranty requirements.

WARRANTY

General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

Standard Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashings resulting from defects in materials or workmanship for the following warranty period:

Warranty Period: 20 years.

PART 2 - PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Built-up Coal-Tar Roofing:

AlliedSignal Inc.
Koppers Industries, Inc.

Polyisocyanurate Board Insulation:

Apache Products Co.

ROOF MEMBRANE PLIES

Ply Felt: Coal-tar-saturated organic felt, complying with ASTM D 227.

Ply Felt: Coal-tar-impregnated, glass-fiber felt, complying with ASTM D 4990, Type I.

FLASHING MATERIALS

Backer Sheet: Asphalt-impregnated, glass-fiber felt, complying with ASTM D 2178, Type IV.

Backer Sheet: Roofing system manufacturer's standard spun-bonded, nonwoven, polyester-reinforced-fabric backer sheet, of standard color and weight, and as follows:

Application Method: Cold asphalt roofing cement.

Flashing Sheet: Roofing system manufacturer's standard asphalt-impregnated and -coated composite flashing sheet, reinforced with a composite polyester/glass-fiber core or nonwoven polyester, and as follows:

Surfacing: Mineral granules.

BITUMEN MATERIALS

Asphalt Primer: ASTM D 41.

Coal-Tar Pitch: ASTM D 450, Type I.

Roofing Asphalt: ASTM D 312, Type III.

AUXILIARY MEMBRANE MATERIALS

General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.

Furnish liquid-type auxiliary materials that meet VOC limits of authorities having jurisdiction.

Coal-Tar Roofing Cement: ASTM D 5643, coal-tar-based roofing cement, asbestos free.

Cold-Applied Flashing Adhesive: Roofing system manufacturer's standard asphalt-based, 1- or 2-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with modified bituminous membranes.

Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470; designed for fastening base sheets and base flashings and for backnailing built-up membrane to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."

Cants: Perlite board, complying with ASTM C 728.

Wood Nailers and Curbs: Pressure treated, No. 2 grade Southern Yellow Pine.

Walkway Pads: Mineral-surfaced asphaltic composition panels or heavy-duty solid-rubber pads, factory formed, nonporous, with a slip-resisting surface texture, manufactured specifically for adhering to built-up roofing as a protection course for foot traffic, of the following thickness:

Thickness: 1/2 inch (12 mm).

Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

Carey-Tred; Celotex Corp.
Whitewalk Roof Pads; W.R. Meadows.

Aggregate Surfacing: Clean, dry, opaque, water-worn gravel or crushed stone, free of sharp edges, complying with ASTM D 1863.

Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer for intended use.

INSULATION MATERIALS

General: Provide preformed, roofing insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses indicated.

Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

Polyisocyanurate Board Insulation: Rigid, cellular polyisocyanurate thermal insulation with core formed by using HCFCs as blowing agents complying with ASTM C 1289, classified by facer type as follows:

Facer Type: Type II, felt or glass-fiber mat on both major surfaces.

Perlite Board Insulation: Rigid, mineral-aggregate thermal insulation board consisting of expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal-coated, complying with ASTM C 728.

INSULATION ACCESSORIES

General: Furnish roofing insulation accessories recommended by insulation manufacturer for intended use and compatible with sheet roofing material.

Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470, designed for fastening roofing insulation to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

Tapered Edge Strips: Rigid, perlite insulation board, complying with ASTM C 728.

PART 3 - EXECUTION

PREPARATION OF EXISTING SUBSTRATE

Remove all existing roofing membrane, insulation and composition and metal flashings in preparation for the installation of the new roof system.

No more roof shall be removed than can be made weather-tight during the work day.

Unless otherwise indicated on the Drawings, existing metal counter flashing may be reused if structurally sound and of good appearance. The reuse of any metal flashings must be first approved by the Architect.

If the installer finds the substrate unacceptable and outside the preparation requirements contracted for, it is to be immediately reported to the Owner's representative in writing.

Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

PROTECTION

Protection adjacent building surfaces and landscaping from damage from roofing work.

GENERAL INSTALLATION REQUIREMENTS

Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA "Quality Control Guidelines for the Application of Built-up Roofing."

Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.

Cant Strips: Install and secure preformed 45-degree cant strips at junctures of built-up roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.

Cooperate with inspecting and testing agencies engaged or required to perform services for installing built-up roofing membrane system.

Coordinate installing roofing system components so insulation and roofing plies are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.

Provide cutoffs at end of each day's work to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.

Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

Remove and discard temporary seals before beginning work on adjoining roofing.

Bitumen Heating: Heat bitumen and apply within plus or minus 25 deg F (14 deg C) of equiviscous temperature, unless otherwise required by roofing system manufacturer. Do not raise bitumen temperature above the equiviscous temperature range more than one hour before time of application. Do not exceed bitumen manufacturer's recommended temperature limits during bitumen heating. Do not heat bitumen within 25 deg F (14 deg C) of flash point. Discard bitumen maintained for more than 4 hours at a temperature exceeding 325 deg F (163 deg C) for coal-tar pitch or 400 deg F (204 deg C) for roofing asphalt. Keep kettle lid closed, unless adding bitumen.

Bitumen Mopping Weights: For interply and other moppings, unless otherwise indicated, apply solid moppings of hot coal-tar pitch between ply felts at a minimum rate of 20 lb/100 sq. ft. (1 kg/sq. m).

Bitumen Drippage: Prevent bitumen drippage from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction. Install felt strip envelopes at edges and penetrations. If mopping is applied directly to substrate, tape substrate joints.

INSULATION INSTALLATION

Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

Comply with roofing system manufacturer's written instructions for installing roofing insulation.

Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

Install two layers of polyisocyanurate board and cover layer of perlite board with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

Trim surface of insulation where necessary at roof drains so completed surface is flush with ring of drain.

Install insulation with long joints of insulation in continuous straight lines with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

Attached Insulation: Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m), unless a greater weight is required by roofing system manufacturer, and allow primer to dry. Set each layer of insulation in a solid mopping of hot roofing asphalt.

ROOF MEMBRANE INSTALLATION

Install ply felts according to roofing system manufacturer's written instructions, starting at low point of roofing system. Align ply felts without stretching. Shingle side laps of ply felts uniformly to achieve required number of membrane plies throughout. Shingle in direction to shed water. Extend ply felts over and terminate beyond cants.

Install 4 ply felts (3 coal-tar organic felt plies and 1 coal-tar impregnated, glass fiber felt).

Application: Embed each ply felt in a solid mopping of hot coal-tar pitch applied at rate required by roofing system manufacturer, to form a uniform membrane without ply felts touching each other.

Each ply shall be pressed (broom or squeegee) into place to assure total adhesion and that the ply is free of air pockets, wrinkles, fishmouths, or open laps.

The total membrane system must be completed at one time. Phased construction is not permitted.

At membrane edges requiring an envelope to avoid pitch migration, construct an envelope using at least two (2) plies of coal tar saturated organic felt.

Care shall be taken at all locations to seal membrane penetrations which might allow pitch to flow into the building, drains, etc...

When flashings are not immediately installed, strip edge of membrane to seal out the moisture.

Install lapped glass-fiber ply felts over organic ply felts according to roofing system manufacturer's written instructions, starting at low point of roofing system. Offset laps from laps of preceding ply felts and align ply felts without stretching. Lap in direction to shed water. Embed ply felts in a solid mopping of hot coal-tar pitch applied at rate required by roofing system manufacturer. Extend ply felts over and terminate beyond cants.

Aggregate Surfacing: Promptly after installing and testing roof membrane, flashing, and stripping, flood-coat roof surface with not less than 70 lb/100 sq. ft. (3.5 kg/sq. m) of hot coal-tar pitch. While flood coat is hot and fluid, cast the following average weight of aggregate in a uniform course:

Aggregate Weight: 400 lb/100 sq. ft. (20 kg/sq. m), average for gravel or stone.
Aggregate Weight: 300 lb/100 sq. ft. (15 kg/sq. m), average for slag.

Walkway Pads: Install walkway pads at locations shown, using units of size indicated or, if not indicated, of manufacturer's standard size. Sweep away loose aggregate surfacing and set walkway pads in additional flood coat of hot coal-tar pitch.

FLASHING AND STRIPPING INSTALLATION

Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

Prime substrates with asphalt primer if required by roofing system manufacturer.

Backer Sheet Application: Install backer sheet and adhere to substrate in asphalt roofing cement; apply cement at rate required by roofing system manufacturer.

Flashing Sheet Application: Adhere flashing sheet to substrate in cold adhesive applied at rate required by roofing system manufacturer.

Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roof membrane and 4 inches (100 mm) onto field of roof membrane.

Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

Install stripping where metal flanges and edgings are set on built-up roofing according to roofing system manufacturer's written instructions.

Stripping Material: Install stripping of not less than 2 plies of roof membrane felt, setting each ply in a continuous coating of asphalt roofing cement or in a solid mopping of hot coal tar, extended onto roof membrane 4 inches (100 mm) and 6 inches (150 mm), respectively.

Roof Drains: Set 30-by-30-inch (760-by-760-mm) metal flashing or 4-inch- (100-mm-) wide flanged and notched sheet metal gravel stop, 1-1/2 inches (38 mm) high, in bed of asphalt roofing cement on completed built-up roofing membrane. Cover metal flashing sheet or flanges of sheet metal gravel stop with stripping, extending a minimum of 4 inches (100 mm) beyond edge of metal flashing onto field of roof membrane. Clamp roof membrane, metal flashing, and stripping into roof-drain clamping ring.

Stripping Material: Install not less than 2 plies of roof membrane felt, setting each ply in a continuous coating of asphalt roofing cement or in a solid mopping of hot coal tar.

FIELD QUALITY CONTROL

The Owner and/or his authorized representative has, without prior notice, the right to audit all work being performed.

Although not a standard quality control procedure for this application, test cuts may be required in areas where quality is in question. The cost of these test cuts will be the responsibility of the Contractor.

If defects are detected it will be the responsibility of the Contractor to take corrective procedures. Any corrective procedures must have prior approval of the Owner or his representative, and the roof materials manufacturer. If, in the opinion of the Owner or his representative, or the material manufacturer, the corrective procedures are not appropriate, the installation in question must be removed and replaced in an acceptable manner.

Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

Notify Architect and Owner 48 hours in advance of the date and time of inspection.

PROTECTING AND CLEANING

Protect built-up roofing membrane from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07512

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General Terms and Provisions, Special Provisions, Special Conditions of Contract and Technical Specifications.

SUMMARY

This Section includes sheet metal flashing and trim in the following categories:

Removal and replacement of existing sheet metal items unless otherwise indicated on the Drawings.

Removal and replacement of roof-expansion paint cover.

Related Sections: The following Sections contain requirements that relate to this Section:

Division 7 Section "Joint Sealants" for elastomeric sealants.

QUALITY ASSURANCE

Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

PROJECT CONDITIONS

Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

METALS

Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

Factory-Painted Aluminum Sheet: ASTM B 209 (ASTM B 209M), 3003-H14, with a minimum thickness of 0.040 inch (1.0 mm), unless otherwise indicated.

Galvanized Steel Sheet: ASTM A 526, G 90 (ASTM A 526M, Z 275), commercial quality, or ASTM A 527, G 90 (ASTM A 527M, Z 275), lock-forming quality, hot-dip galvanized steel sheet with 0.20 percent copper, mill phosphatized where indicated for painting; not less than 0.0336 inch thick, (22 gage) unless otherwise indicated.

Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, with a minimum thickness of 0.0625 inch (1.6 mm) except not less than 0.0937 inch (2.4 mm) thick for applications where burning (welding) is involved.

MISCELLANEOUS MATERIALS AND ACCESSORIES

Burning Rod for Lead: Same composition as lead sheet.

Solder: ASTM B 32, Grade Sn50, used with rosin flux.

Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.

Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.

Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.

Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

FABRICATION, GENERAL

Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

SHEET METAL FABRICATIONS

General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

Roof-Drain Flashing: Fabricate from the following material:

Lead: 4.0 lb/sq. ft. (1.6 mm thick), hard tempered.

Gravel Stops: Fabricate from the following material:

Aluminum: 0.050 inch (1.2 mm) thick.

Counterflashing: Fabricate from the following material:

Galvanized Steel: 0.0299 inch (22 gage) thick.

Equipment Support Flashing: Fabricate from the following material:

Galvanized Steel: 0.0299 inch (22 gage) thick.

Roof-Penetration Flashing: Fabricate from the following material:

Galvanized Steel: 0.0299 inch (22 gage) thick.

ALUMINUM EXTRUSION FABRICATIONS

Aluminum Extrusion Units: Fabricate extruded-aluminum running units with formed or extruded-aluminum joint covers for installation behind main members where possible. Fabricate mitered and welded corner units.

ALUMINUM FINISHES

General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.

High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.

Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.

Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.

PART 3 - EXECUTION

EXAMINATION

Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

INSTALLATION

General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.

Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.

Do not solder the Aluminum.

Pretinning is not required for Lead.

Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

Use joint adhesive for nonmoving joints specified not to be soldered.

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

Underlayment: Where installing aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.

Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.

Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.

Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.

Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:

Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.

Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

CLEANING AND PROTECTION

Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 07620

SECTION 07920 - JOINT SEALANTS

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General Terms and Provisions, Special Provisions, Special Conditions of Contract and Technical Specifications.

GENERAL

The Work under this Section shall include the following:

Joints as indicated on the Drawings

PRODUCTS

Elastomeric Sealant Manufacturers: Subject to compliance with requirements, provide sealants by one of the following:

Urethane Sealants:

Mameco International.
Pecora Corporation.
Polymeric Systems, Inc.
Sika Corporation.
Tremco.

Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

Colors: Provide colors indicated for exposed joint sealants or, if not indicated, as selected by Architect from manufacturer's full range for this characteristic.

Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant of base polymer specified below:

Single-Component Nonsag Urethane Sealant: Type S; Grade NS; and as follows:

Class 25.

Uses NT, M, A, and O.

Sealant Backings, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

Type C: Closed-cell material with a surface skin.

Type O: Open-cell material.

Type B: Bicellular material with a surface skin.

Type: Any material indicated above.

Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint.

Primer: As recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

EXECUTION

General: Comply with joint sealant manufacturer's instructions for products and applications indicated.

Sealant Installation Standard: Comply with ASTM C 1193.

Acoustical Sealant Application Standard: Comply with ASTM C 919 for use of joint sealants in acoustical applications.

END OF SECTION 07920

SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all Mechanical and Electrical work shown on the drawings and specified hereinafter.

B. Examine other Sections of the Specifications for requirements which affect work of this Division whether or not such work is specifically mentioned in this Division.

C. Coordinate work with that of other trades affecting, or affected by work of this Division. Cooperate with those trades to assure steady progress of work under contract.

1.02 SCOPE OF WORK

A. Provide all labor, materials and equipment for the installation and testing of all mechanical, plumbing and fire protection systems as shown on the drawings and herein specified. All systems shall be complete, tested and ready for operation at time of Substantial Completion Inspection by the owner.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15001 Project Close Out
15002 Operation And Maintenance Manuals
15010 Electric Power and Auxiliaries
15020 Vibration/Noise Isolation
15030 Painting Identification
15200 Piping General
15220 Piping HVAC
15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15400 Air Distribution
15401 Plumbing
15500 Insulation - HVAC
15700 Test and Balance

1.04 WORK NOT INCLUDED IN THIS DIVISION

A. The following work is specified in other Divisions of the specification and is to be provided by others except as specifically included herein

Sheet metal work related to roofing
Roof Replacement
Finish Painting
Electrical work
Masonry and concrete foundations for equipment
Access doors
Flashing, but counter flashing shall be included herein
Cutting and patching

1.05 DEFINITIONS

A. Specific items of terminology, as used herein, shall have the following meanings:

1. WORK: Shall mean to include all materials, labor, and equipment required for a complete and operable installation.

2. PIPING: Shall mean pipe, fittings, flanges, valves, controls, hangers, traps, drains, insulation, vents, and any other items customarily required in connection with the transfer of fluids.

3. CONCEALED: Shall mean embedded in masonry or other construction, installed behind wall furring and within partitions, hung ceilings, crawl spaces or shafts.

4. EXPOSED: Shall mean not concealed.

5. BY OTHER TRADES: Shall mean work that is to be done by persons or parties responsible for work at the project other than the party or parties who have been duly awarded a contract for work of this Division. In the event that this document is used to acquire work as part of a general construction contract, the words "by other trades" shall mean by persons or parties who are not anticipated to be the installers for the work shown under this Division. In this context, the words "by other trades" shall not be interpreted to mean not included in the overall contract.

6. DEMOLITION: Shall mean the removal of any existing equipment, piping, ducts, etc. and the capping or plugging of any existing services.

7. FURNISH: Shall mean purchase and deliver to the project site indicated equipment and/or materials complete with every necessary appurtenance and support.

8. INSTALL: Shall mean unload at delivery point of site; store in a safe protected location at site and perform every operation necessary to establish secure mounting and correct operation at proper location in the project. Include necessary connections to required services.

9. PROVIDE: Shall mean FURNISH and INSTALL.

B. Except where modified by specific notation to the contrary, it shall be understood that indication and/or description of any item, in drawings or specifications or both, carries with it the instruction to furnish and install item, regardless of whether or not this instruction is explicitly stated as part of indication or description.

1.06 QUALITY ASSURANCE

A. GENERAL

1. It is the intent of the drawings and specifications to obtain a complete, operable and satisfactory installation.

2. All materials shall be new, be properly labeled and/or identified, and be in full compliance with the contract documents.

3. All work shall comply with applicable Codes and Standards.

4. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

B. INSTALLER'S QUALIFICATIONS

1. All installers performing work under any section of this Division shall be a licensed firm regularly engaged in providing the work specified under these sections.

2. Installer shall be able to provide, upon request, a list of at least five similar jobs he has completed in the last two (2) years

C. DRAWINGS AND SPECIFICATIONS

1. Drawings are diagrammatic but shall be followed as closely as actual construction of the building and the work of other trades will permit.

2. The specifications and drawings are complementary and are to be taken together for a complete interpretation of the work. Exceptions are those notes on drawings which refer to an individual element of work. These notes take precedence over the specifications when they conflict.

3. The separate divisional drawings and specifications shall not relieve contractor from the responsibility to provide the work which is indicated on any of the drawings or division of the specifications.

4. The drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Therefore, no interpretation shall be made from the limitations of such symbols and diagrams that any elements of work necessary for a complete installation are excluded.

5. Certain details appear on the drawings which are specific with regard to the dimensioning and positioning of the work. These details are intended only for the purpose of establishing general feasibility. They do not obviate field coordination for the indicated work.

6. Examine the architectural, structural, electrical and mechanical drawings and specifications prior to submitting bid. Architectural and structural drawings take precedence over mechanical drawings with reference to building construction, location of plumbing fixtures, and any other similar fixed items.

7. The Architect shall be notified of any discrepancies, omissions, conflicts or interferences which occur between drawings and specifications. If such notification is received in adequate time additional data or changes will be issued by addendum to all bidders.

8. In the event that extra work is authorized, and performed by these trades, work shown on drawings depicting such work, and/or described by addendum or Change Order is subject to this specification in all respects.

D. STANDARDS

1. Certain materials and installation procedures are described by reference to industry standards. These standards are as follows:

ASTM American Society for Testing Materials

ASME	American Society for Mechanical Engineers Code of Unfired Pressure Vessels
NFPA	National Fire Protection Association
NEMA	National Electrical Manufacturers Association
UL	Underwriter's Laboratories
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
AMCA	Air Movement and Control Association
ARI	Air Conditioning and Refrigeration Institute

2. For additional standards see others sections of the specifications.

3. Whenever a reference is made to a standard, installation and materials shall comply with the latest published edition of the standard at the time project is bid unless otherwise specified herein.

E. CODES AND RULES

1. All material furnished and all work installed shall comply with the following codes as they apply to this project:

   Applicable County, State and Local Building Codes

   All mechanical equipment that is electrically powered shall comply with the requirements of Section 5-183 of the City of Tampa Code.

   Local and State Fire Marshal Rules and Regulations

   Occupational Safety and Health Agency Standards. (OSHA)

   State of Florida Model Building Energy Conservation Code (1993 Edition).

2. Applicable codes shall be those adopted by the authority having jurisdiction at the time project is bid.

3. The installer shall inform the Architect of any work or materials which conflict with any of the applicable codes, standards, laws and regulations before submitting his bid.

4. The installer shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and drawings required to comply with all applicable laws, ordinances, rules and regulations.

1.07 PERMITS, FEES AND INSPECTIONS

A. The contractor shall give the necessary notices, obtain all permits and pay all government fees, sales taxes and other costs, including utility connections or extensions, in connection with this work. File all permit applications required by all governmental departments having jurisdiction.

B. Obtain all required certificates of inspection for work and deliver them to the Architect before requesting acceptance and final payment for the work.

PART 2 MATERIALS

2.01 GENERAL

A. Materials or products specified herein and/or indicated on drawings by trade name, manufacturer's name and/or catalog number shall be provided as specified. Substitutions will not be permitted except as described herein and in the Supplementary and General Conditions.

B. Since manufacturer's reserve the right to change their products at anytime, installers shall verify all dimensions, performance data, etc. for each piece of equipment submitted to assure compliance with the intent of the drawings and specifications.

C. For review of manufacturers' products other than those specified, bidders shall submit to the Architect a request in writing. This request shall be received at least seven (7) days prior to bid date and hour to allow for inclusion in the last addendum prior to bid date. Requests transmitted via facsimile and/or received after this time will not be considered. Approval, when granted, will be in the form of an addendum.

D. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, performance data, list of references and other information necessary to completely describe the product.

E. Where an accepted substitution or deviation requires different quantity or arrangement of foundations, supports, ductwork, piping, wiring, conduit, and any other equipment or accessories normal to this product, contractor shall furnish said changes and additions. In addition, contractor shall pay all costs for all changes and additions to his work and the work of others affected by this substitution or deviation.

F. Deviations mean the use of any listed manufacturer other than those used on the drawings as the basis of design.

G. A list of all materials and equipment which the installer proposes to furnish shall be submitted for approval within then (10) days after the contract has been awarded. Data shall be complete in all respects.

2.02 SHOP AND ERECTION DRAWINGS AND SAMPLES

A. Submit required and/or requested fabrication and installation drawings, for review by Architect, before ordering or installing any equipment or materials. Equipment or materials ordered or installed before Architect review may not be accepted and will have to be removed from the project.

B. Shop drawings shall consist of manufacturer's scale drawings, copies of catalogs, and other descriptive literature which clearly indicates the construction materials, physical dimensions, proper utility requirements, wiring diagrams, operating and performance data clearly marked for each item. Data of general nature is not acceptable.

C. Submittals for equipment scheduled on the contract documents shall include detailed and itemized schedules in the same format as shown on the drawings. Failure to provide required schedule will result in rejection of the complete submittal.

D. Listed manufacturers, either named in the specifications or by addendum, are subject to full compliance with specifications, schedules, and drawings. It is the contractors responsibility to submit for review, products which meet the intent of the Contract Documents. Submittals of products that do not meet the specified quality, noise criteria, capacity, performance range, air/water pressure drop, efficiency, etc. will be rejected. When submitted and reviewed products and materials fail to perform within the specified parameters, contractor shall modify and/or replace such products and materials at no additional cost to the contract.

E. Shop drawings that deviate from the contract documents shall list all differences in a cover letter attached to the submittal. Any unlisted deviations found during review will result in the rejection of the entire submittal.

F. Submit shop drawings assembled together in a 3 ring hard cover binder. Provide an index for ease of processing and record keeping. Index shall correspond to specification section numbers.

G. When requested, submit samples for review. The samples shall be properly tagged and will remain in the Architect's possession until final acceptance of the work.

H. The Architect's review does not relieve the contractor of his responsibility to comply with all requirements of the contract documents.

I. With each submittal provide certification that the material, product, systems, etc., is in full compliance with the requirements of these documents.

2.03 FIRE STOPPING

A. Unless otherwise noted on drawings; modified by Architect and/or authorities having jurisdiction, the following materials may be used.

1. Rock wool: Minimum four pounds for cubic foot density; flame spread 15, smoke developed 0, fuel distribution 0 by ASTM E84; minimum melting point 2000 degrees F.
2. Concrete and masonry are also approved firestop materials by NFPA 90A.
3. UL approved products such as Dow-Corning RTV Silicone Foam; 3M Fire Barrier.

B. UL, NFPA and manufacturer's recommendations shall be strictly followed.

C. Submit complete data on fire stopping materials and construction methods for review by Architect before proceeding with work.

PART 3 EXECUTION

3.01 ORGANIZATION OF THE WORK

A. Proceed with work as fast as possible to meet all construction schedules. At all times keep a competent superintendent in charge of the work. Superintendent shall be replaced if unsatisfactory to the Owner and/or Architect.

B. Maintain a complete file of all contract and shop drawings at the site available for inspection by Owner's representatives.

C. Upon installation of equipment, shop drawings shall be initialed and dated. This procedure will ensure proper scheduling and allow Owner's representatives to check the work in progress.

3.02 COORDINATION WITH OTHER TRADES

A. Coordinate work with other trades to avoid interferences and delays. Assist in working out space requirements to make a satisfactory installation. Notify the Architect of any major conflicts that cannot be resolved through normal field coordination with other trades.

B. If work is installed before coordinating with other trades, so as to cause any interferences with work of other trades, the installer shall make the necessary changes in the work to correct the condition without extra charge.

C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

3.03 FIRE STOPPING

A. Duct and pipe penetrations of fire rated walls and/or floors shall be sealed to maintain integrity of construction and prevent the passage of flame and hot gases. The opening in the construction around the air duct shall not exceed 1" average clearance on all sides prior to application of sealant. Where fire dampers are installed, proper clearance for expansion shall be maintained as required by installation instructions.

B. All products, materials and methods of installation shall be UL approved and meet NFPA 251 requirements.

C. Fire rated construction assemblies are specified under architectural section of the contract documents.

3.04 CUTTING AND PATCHING

A. The cutting and patching of roof, walls, partitions, ceilings and floors necessary for reception of this trade's work caused by his failure to provide or properly locate sleeves, forms and inserts, or caused by incorrect location of his work shall be his responsibility.

B. When it becomes necessary to cut finished materials, submit for the Architect approval, drawings showing the work required and obtain approval before doing such cutting.

C. Chases and openings in walls/roofs and floors may be provided under the work of other sections. Furnish exact dimensions and locations of these openings to suit the apparatus to be used before such walls are built.

D. No structural members shall be cut without the previous <u>written</u> approval of the structural engineer and the Architect.

3.05 EXAMINATION OF EXISTING CONDITIONS

A. Visit and carefully examine those portions of the site and/or present buildings affected by this work so as to become familiar with existing conditions and difficulties that will affect the execution of the work before submitting proposals.

B. Submission of a proposal will be construed as evidence that such examination has been made and later claims for labor, equipment or materials required because of difficulties encountered, which could have been foreseen had such examination been made, will not be recognized.

3.06 DEMOLITION

A. Demolition shall be as shown on drawings and/or specified.

B. Schedule all demolition work with Owner/Architect to cause minimum downtime of any building service or function. No extra cost to the contract will be allowed for overtime work unless authorized in writing by the Owner/Architect.

C. Drawings are diagrammatic and show only major obstructions; coordinate with other trades for removal or relocation of pipes, conduits, hangers, etc., in path of work.

D. Caps on insulated ductwork or piping shall be insulated.

E. At each location where work is to be performed, the Contractor shall examine the existing conditions to determine the nature and extend to which the existing systems must be removed, modified or rearranged to accomplish the work of this contract. In addition, the Contractor shall determine the extent to which portions of the existing building must be cut, altered and restored to accommodate the project modifications. In every instance, the Contractor shall be responsible for the correctness, adequacy, fit and alignment of new work with existing conditions, and for the satisfactory restoration of affected building work as approved by the Owner.

F. The Contractor shall provide and maintain all required temporary barricades, bullheads, enclosures, protection of openings, etc. necessary for the safety of personnel and of the public, and for the satisfactory progress of the work. The Contractor shall not impede or barricade essential access ways required by the building occupants without providing other alternate temporary access approved by the Owner. Dustproof partitions shall be used to protect finished spaces.

G. The Contractor shall protect existing building contents, equipment, fixtures, the building structure and its finishes from damage due to dust, falling debris, or any other work operations. Repair or replace any damage to existing facilities at no extra cost to the contract.

H. Equipment or other items to be reused shall be carefully dismantled or disconnected in a manner to avoid damage. Items damaged by the contractor's operations shall be replaced or repaired in a manner satisfactory to the Owner. Items not to be re-used shall be removed from the site by the Contractor, except

those designated to be turned over to the Owner, which shall be delivered to a location designated by the Owner.

I. In each area where work is performed, the work area shall be kept in a neat, clean condition. Rubbish and debris shall not be allowed to accumulate and shall be removed daily if necessary to maintain clean conditions satisfactory to the Owner.

J. In barricaded areas, approved signs shall be provided to inform the building staff of the work under construction. Signs shall be about 2ft. by 3 ft. in size and shall contain no advertising. Drawings of proposed signs shall be submitted to the Owner for prior approval.

3.07 FIRE PROTECTION OF CONSTRUCTION SITE

A. At all times, the Contractor shall conduct his operations in a manner to prevent fire hazards. Such conduct shall include, but is not limited to, the provision of adequate housekeeping measures and the regular removal of debris and rubbish from the premises.

B. During all welding and burning operations, and during such periods when alarm systems, smoke detectors, etc. are not in service, fire control measures shall be provided in accordance with insurance company regulations. During welding and burning operations, the Contractor shall provide an approved fire extinguisher in good operating condition at each location.

3.08 SEQUENCING AND SCHEDULING OF WORK

A. All work to be performed under this contract shall be carried out in accordance with an approved construction sequence and schedule. Upon award of the contract, and prior to commencing work at the building, the Contractor shall prepare and submit a detailed schedule of his proposed sequence of work and the dates of completion of the various portions of the work.

B. Work shall be sequenced and scheduled to maintain comfort conditions in occupied areas to the extent possible, and to minimize down-time and disruption of active HVAC systems.

C. Where existing active building systems and services must be disrupted to permit modification, relocation or connection of new work, the work shall be carefully planned to minimize down-time. In each instance, preparatory work shall be completed to the maximum extent possible, and required tests completed where feasible, before the particular system or service is shut down to permit final connection or switch over.

D. Certain operating areas will be available to the Contractor on a restricted time basis each day or at night. Work shall be scheduled so that such areas are fully

functional during the periods they are in use by the Owner and the Contractor shall insure that all temporary barricades, access ways, protection, and related items are satisfactorily in place during the periods that these areas are in use by the Owner.

3.09 CONNECTIONS TO EXISTING WORK

A. Plan installation of new work and connections to existing work to insure minimum interference with regular operation of existing facilities.

B. Submit to the Owner for approval, a schedule of necessary temporary shut-downs of existing services. All shutdowns shall be made at such times as will not interfere with regular operating of existing facilities and only after written approval of the Owner.

C. To insure continuous operation, make necessary temporary connections between new and existing work.

D. Connect new work to existing work in neat and approved manner. Restore existing work disturbed to original condition.

E. After connections to existing work are completed, remove all existing work such as ductwork, piping, conduit, wiring, etc. which is no longer required as part of the new work.

3.10 STORAGE OF MATERIALS

A. All materials stored on site shall be properly protected from injury or deterioration. Materials shall not be stored in contact with ground or floor.

B. Do not remove manufacturer's packing materials until ready to install. Materials showing signs of corrosion, improper handling or storage shall be replaced at no cost to the Owner.

C. Provide continuous protection for all equipment already installed.

3.11 WATERPROOFING

A. Coordinate with Roof Installer.

3.12 TESTS

A. Include all tests specified and/or required under laws, rules and regulations of all departments having jurisdiction. Tests shall also be performed as indicated herein and other sections of the specifications.

B. Notify the Architect at least 72 hours in advance of all tests. Furnish all necessary instruments, gauges and other equipment required for tests. Make preliminary tests prior to giving notice of final tests.

C. All parts of the work and associated equipment shall be tested and adjusted to work properly and be left in perfect operating condition.

D. Correct defects disclosed by these tests without any additional cost to the Owner. Repeat tests on repaired or replaced work.

E. Maintain a log of all tests being conducted and have it available for review by the Architect. Log to indicate date, type of tests, duration, and defects noted and when corrected.

END OF SECTION

SECTION 15001- PROJECT CLOSE OUT

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all Mechanical work shown on the drawings and specified hereinafter.

B. Examine other Sections of the Specifications for requirements which affect work of this Division whether or not such work is specifically mentioned in this Division.

1.02 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15700 Test and Balance

PART 2 MATERIALS

NOT APPLICABLE

PART 3 EXECUTION

3.01 ACCEPTANCE INSPECTION

A. Refer to requirements of the General Conditions of the Contract. Representatives of all installers responsible for work under this Division shall be present at the time of substantial completion inspection and shall have mechanics, tools and ladders available to assist in the inspection.

B. They shall also be in compliance with the following:

1. Have all work specified under this Division of the Specifications complete and ready for inspection. The contractor shall perform his own inspection of the work prior to requesting an inspection from the engineer. The contractor shall provide hard copy of his punch list prior to the engineer's inspection.

2. Have each system tested and balanced to assure compliance with contract documents. Provide the Engineer with copies of Test and Balance Report at least one week prior to the scheduled Substantial Completion Inspection.

3. Replace all temporary filter medias at each air handling equipment with the clean final filters as specified.

4. Clean all coils that may have accumulated dirt during construction.

C. A list of items to be corrected as a result of this inspection will be furnished to the contractor. Notify Architect in writing of any items appearing on list of correction that are disputed by installer. When ready, request in writing a re-inspection of work. Request shall include a copy of the original punch list with the initials of the contractor's representative whom has verified that all items on the punch list have been completed.

D. In the event that additional site visits by the Architect/Engineer are required beyond the substantial and final inspections due to the contractors failure to complete all listed deficiencies, these additional inspections will be paid by contractor at the rate of $ 70.00 per hour to Architect/Engineer whose time is involved. This amount may be deducted from the project's final payment.

3.02 GUARANTEES AND CERTIFICATIONS

A. All work shall be guaranteed to be free from leaks, damage or defects. Any defective materials or workmanship shall be replaced or repaired as directed any time during the duration of the guarantee period.

B. Entire system(s) shall be guaranteed for a period of four (4) years from the date of substantial completion.

C. This project includes removing and reinstalling existing equipment. The contractor shall guarantee only the parts and/or work actually completed by the contractor. Verify equipment operating condition before removing it.

D. The date of acceptance and start of all warranties and guaranties shall be established by the Architect through a formal notice to the contractor.

3.03 RECORD DRAWINGS

A. During the course of construction the contractor shall keep a set of mark-up prints indicating all deviations and changes from the work indicated on the contract drawings.

B. Above information shall be used by the contractor to prepare one set of as-builts reproducible drawings as a record of all construction revisions and changes from the contract drawings. Include all revisions to equipment schedules.

C. Upon completion of the work and within 30 days after acceptance by the Architect, contractor shall furnish the Architect with a revised and final set of reproducible and a set of prints showing all work as installed.

3.04 OPERATIONS/MAINTENANCE MANUALS

A. Furnish three copies of manufacturer's operating and maintenance manuals, including wiring diagrams, operating procedures and parts list for each piece of equipment or systems.

B. A complete maintenance manual shall be prepared by the contractor and submitted to the Architect for approval along with or prior to request for final acceptance inspection.

3.05 OPERATING INSTRUCTIONS

A. Instruct representatives of Owner in operation and maintenance of all installed systems and equipment.

B. Provide maintenance manual and acquaint Owner's representative with its contents during instruction.

C. Furnish letter naming Owner's personnel receiving instruction and dates when instructions was given.

D. Provide name, address and telephone number of the manufacturer’s representative and service company, for each piece of equipment so that service or spare parts can be readily obtained.

END OF SECTION

SECTION 15002 - OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all Mechanical work shown on the drawings and specified hereinafter.

B. Examine other Sections of the Specifications for requirements which affect work of this Division whether or not such work is specifically mentioned in this Division.

1.02 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15700 Test and Balance

B. The operation and maintenance manuals shall be prepared in accordance with ASHRAE Guideline 4-1993 and as specified herein.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.01 OPERATION AND MAINTENANCE (O&M) DOCUMENTATION PACKAGE

A. The complete O&M documentation package shall be submitted to the Architect one month prior to the request for substantial completion inspection.

B. The O&M documentation package shall include but not be limited to the following:

1. O&M Documentation Directory(s).
2. Emergency information(s)
3. Operating manual(s)
4. Maintenance manual(s)
5. Test reports
6. Construction documents

3.02 O&M DOCUMENTATION DIRECTORY

A. The Documentation Directory shall include the list of documents contained in the O&M manual, a list of equipment and the equipment's identifying tag.

3.03 EMERGENCY INFORMATION

A. The emergency information section of the O&M manual shall include a list of all equipment and name of the local company providing emergency repair service.

B. Provide addresses, telephone numbers, and contact person of all companies listed in this section of the O&M manual.

3.04 MAINTENANCE MANUAL

A. The maintenance manual section of the O&M manual shall contain all relevant information required to properly maintain the building system(s).

B. The maintenance manual shall be divided into two sub-sections. The first sub-section shall contain a complete equipment inventory and the second shall contain the maintenance procedures for the equipment.

C. The maintenance manual section shall also contain the following information as a minimum:

1. Description (specification) of the equipment: this should consist of easily read drawings accompanied by a clear description of each component.
2. Description of function, as applicable: the function of equipment, procedures before start-up, functional part loads, and performance verification procedures.
3. Recommended maintenance procedures and their recommended frequency for site-specific application.
4. Recommended list of spare parts, part numbers, and the location from which they can be obtained.
5. Original purchase order number; date of purchase; name, address and phone number of the vendor.
6. Warranty information.
7. Installation information.
8. Any other information needed for the preparation of documents supporting the management of operation and maintenance programs.

3.05 TEST REPORTS

A. The O&M manual shall contain one copy of the Test and Balance Report. Refer to Section 15700 of the project manual for additional requirements.

3.06 CONSTRUCTION DOCUMENTS

A. Provide one hard copy of as-built documents. As-built documents shall contain complete equipment schedules for the equipment actually installed.

B. In addition provide one 3-1/2” diskette containing CADD drawing files for the as-built documents. All drawing files shall be Autocad R-12 format.

END OF SECTION

SECTION 15010 - ELECTRICAL POWER AND AUXILIARIES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions, and Section 15000 shall apply to all work under this Section.

B. Examine other Sections of the specifications for requirements which affect the work of this Section whether or not such work is specifically mentioned in this section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with those trades to assure the steady progress of work under this contract.

1.02 SCOPE OF WORK

A. Motor controllers shall be provided with accessories such as H.O.A.'s, selector switches, pilot lights, etc., as required for the proper control and operation of the mechanical equipment and systems they are part of. See control sequence of operation for required accessories.

1.03 RELATED DOCUMENTS

A. The following sections of the Specifications are included hereinafter.

Division 16-Electrical Systems

15000 Mechanical General Requirements
15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15400 Air Distribution

1.04 QUALITY ASSURANCE

A. All electrical work and related equipment shall meet the requirements of National Electric Code (NEC), UL, NEMA and other applicable codes and standards.

B. All work shall be tested and be free of shorts and grounds. Work to be inspected and approved by authorities having jurisdiction.

C. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 SHOP DRAWINGS

A. Submit complete shop drawings, wiring diagrams and other required manufacturer's literature for all products and materials specified or referred to in this section.

B. Provide proof of compliance with requirements of Division 16 whenever reference is made to that Division in this Section.

PART 2 MATERIALS

2.01 MOTORS

A. Unless specifically noted otherwise in other sections of this specification, all motors and motor controllers shall meet the requirements specified in this section.

B. All motors shall be built in accordance with the current applicable IEEE, ASA, and NEMA Standards. All general purpose motors shall be open drip-proof machines for installation indoors and/or in protected locations. Totally enclosed fan cooled (TECF) motors shall be used in all areas of exposure to weather or other environmental contamination. Motors shall be rated explosion proof when located in hazardous atmospheres. Type II weather protected motors may be used in lieu of TEFC motors on roof mounted fan units and similar equipment.

C. Unless indicated otherwise, motors shall be NEMA Design B with a service factor of 1.15 with a total temperature rise of 90 degrees C. (Resistance measured) in 40 degrees C. ambient when powered from the system voltage feeding the motor. Insulation shall be Class F. TEFC motors shall have a service factor of 1.00 with total temperature rise of 80 degrees C. in the above conditions. Motors located in areas exceeding 40 degrees C. ambient shall be factory rated for the ambient temperature of the motor environment. Single phase motors shall generally be NEMA Design N split phase induction motors with built-in thermal protectors. Single phase motors connected on loads requiring high starting torque shall be capacitor-start induction motors. Single phase motors of 1/10 hp or less may be shaded pole induction motors.

D. Electrical characteristics of motors (voltage, phase, hertz) shall be as shown on electrical drawings.

E. If the installer proposes to furnish motors varying in horsepower and/or characteristics from those specified, he shall first inform the Architect of the

change. If change is accepted, installer shall assume full responsibility for the coordination with other trades and pay all additional charges in connection with the change.

F. All motors supplied on this project one (1) hp and larger shall have a power factor of not less than 85 percent under rated load conditions. Power factor of less than 85 percent shall be corrected to at least 90 percent under rated load conditions. Power factor corrective devices, installed to comply with these standards, shall be switched with utilization equipment.

G. All motors that operate in conjunction with variable frequency drives shall be premium efficiency type with Class "F" insulation specifically designed and rated for that application. Manufacturer shall be Lincoln Electric inverter duty VTAC or approved equal.

2.02 INDIVIDUAL MOTOR CONTROLLERS

A. Furnish and install individual motor controllers as specified herein for all motors except those served from motor control centers, or those in pieces of equipment with factory-mounted motor controllers as integral parts.

B. The motor controllers shall be steel-mounted and front wired with all terminals accessible for wiring directly from the front. No slate or ebony asbestos shall be permitted on any size controller from Size 00 through Size 8. All contacts shall be solid silver cadmium oxide alloy which will not require any filing, dressing, or cleaning throughout the life of the control equipment. Bare copper or silver-flashed type shall not be permitted. Operating coils shall be pressure molded and so designed that if accidentally connected to excessive voltage they will not expand, bubble, or melt. When a coil fails under over voltage conditions, the motor controller shall definitely drop out and not freeze the contacts in the "ON" position.

C. Overload relays shall be furnished for each phase and shall be of the hand-reset trip-free variety so that blocking the reset mechanism in the reset position will not prevent the motor controller from dropping out if the motor is overload. This specifically excludes those overload relays which change to automatic reset from hand-reset when the reset mechanism is blocked. Accidentally depressing the reset button or mechanism will not shut-off the motor. Overload relays shall <u>not</u> be field convertible from hand to automatic reset type.

D. It shall be possible to field-add one or more extra N.O. or N.C. interlocks to all motor controllers except Size 00 without removing existing wiring or removing the controller from its enclosure.

E. Any full voltage magnetic motor controllers indicated to be furnished under this Division shall be similar and approved equal to G.E. 200-line Bulletin Numbers as follows:

1. Individual three phase motor controller: GE Bul. CR206.

2. Individual single phase motor controller: GE Bul. CR206.

3. Combination three phase motor controller with circuit breaker: GE Bul. CR208.

F. In general, motor controller enclosures shall be NEMA Type 1, general purpose unless exposed to the weather or unless otherwise specified on the Drawings. Motor controllers exposed to the weather shall be NEMA Type 4, watertight.

G. Generally, holding coils in full voltage magnetic motor controllers shall be suitable for use on 120 volt, AC control voltage. Each controller shall have a control power transformer with primary fuses.

H. All three phase full voltage magnetic motor controllers shall have overload protection in all three phases. All single phase full voltage magnetic motor controllers shall have overload protection in ungrounded phases.

I. Motor controller shall be provided to properly coordinate with the motors to be furnished by this Division. See Contract Documents for motor types, horsepower, control requirements, etc.

J. Motor controllers shall be provided with accessories such as H.O.A.'s, selector switches, pilot lights, etc., all internal shall be copper.

K. Each motor controller shall be equipped with a 120 volt red running pilot light and a hand-off-automatic or start-stop push-button, as required by the Mechanical Contractor. Pilot lights will be operated by an interlock on the motor controller not placed across the operating coil. In addition to the "holding interlock and pilot light interlocks", each controller shall have two extra interlock contacts which shall be field convertible to normally open or normally closed.

L. Manufacturers listed hereinafter are the basis of the Specification. Substitution of materials of the same function and performance are acceptable in conformance with these Specifications and General Conditions: General Electric, Cutler-Hammer, or Westinghouse.

2.03 DUCT MOUNTED SMOKE DETECTORS

A. Provide UL listed duct mounted smoke detectors as indicated on the Contract Documents and/or as specified herein in accordance with NFPA 90A.

B. Mechanical plans indicate the general location of duct detectors. Actual location in the field shall be determined by the fire alarm installer in accordance with detector manufacturer's installation instructions. Mechanical installer shall install

detectors under the supervision of the fire alarm installer. When, because of field limitations, detector manufacturer's recommended clearances can not be obtained, the fire alarm installer shall simulate a smoke air flow test or a certified differential pressure test of each device. Provide a copy of the field test to the owner's representative certifying that the detector as installed is functional.

C. Duct detectors shall be Edwards Systems Technology model DH400 or approved equal, 24 V AC/DC or 120 V with sampling tube and BRK 4PA451 remote CED with sounder. Smoke detector shall shut down each air handling unit upon detection of smoke in the air stream. Sampling tube shall extend a minimum 2/3 distance through duct.

END OF SECTION

SECTION 15020 - VIBRATION/NOISE ISOLATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions, and Section 15000 shall apply to all work under this section.

B. Examine other Sections of the specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE OF WORK

A. All equipment and systems provided under this Division shall operate, under all load conditions, free of objectionable sound and vibration. Conditions considered objectionable by the Architect shall be corrected in an approved manner at no cost to the contract.

B. Vibration control shall be by means of approved vibration eliminators in manner as specified and as recommended by the manufacturer of the eliminators.

C. Sound/noise control shall be by means of approved materials, installation techniques, etc., indicated herein, in other sections of the specifications and/or as recommended by the equipment manufacturer.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15400 Air Distribution

1.04 QUALITY ASSURANCE

A. All equipment having moving parts shall be isolated from the building structure by means of vibration eliminator or isolation materials, unless otherwise noted.

B. All isolation Products/Materials shall be the same brand and shall be supplied from the same source. Manufacturer's recommendations shall be followed in the selection and installation of isolators/materials.

C. Vibration isolators shall have sufficient resilience to meet the following minimum efficiencies:

Motor HP	Slab on Grade	Structurally Supported Heavy Construction Floors	Structurally Supported Lightweight Floors
Up to 5	50%	75%	90%
7-1/2 to 15	70%	85%	93%
20 to 40	80%	90%	95%
50 to 100	90%	95%	97.5%

D. Spring isolators shall be of the unhoused stable springs type.

E. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 SHOP DRAWINGS

A. Submit complete manufacturers data on all isolators and/or materials. Provide samples if requested. Provide certified laboratory test data if requested.

1.06 APPROVED MANUFACTURERS

A. Isolation materials shall be as manufactured by consolidated Mason, Kinetics, Avnec, Vibration Eliminator Co., and Amber/ Booth Co.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.01 GENERAL

A. The installer shall supervise the construction of all foundations and supports, whether they are built by them or not, in order that they may be constructed in such manner as to prevent the transmission of objectionable noise and/or excessive vibration.

B. Excessive vibration or objectionable noise created in any part of the building by the operation of any system and/or equipment furnished and/or installed under this Division will not be permitted and shall be corrected at no cost to the contract.

C. Isolate the various system components and/or equipment from the building structure by such means as may be necessary to eliminate all excessive vibration and objectionable noises they generate. Design all foundations, supports, etc., with this end in view.

3.02 ACCEPTANCE

A. When requested by the Architect the supplier of the isolating equipment shall, upon completion of the job, check all isolating materials and verify that they are installed properly. Provide a written report.

END OF SECTION

SECTION 15030 - PAINTING-IDENTIFICATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions, and Section 15000 shall apply to all work under this section.

B. Examine other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE OF WORK

A. All piping, ductwork and equipment exposed to view, to the weather and/or as indicated on the drawings and specifications shall be painted unless otherwise noted.

B. All galvanized metals that are to be field painted shall be properly prepared to accept specified paint.

C. All piping and equipment shall be labeled and/or identified as herein specified.

D. All valves shall be tagged and valve charts provided.

E. All equipment shall have factory standard finish. Field painting of equipment over standard finish shall be by Owner.

F. Field finish painting shall be by Owner. This installer shall leave all his work clean and free from oil, dirt and grease. Apply primer ready to field painting, where required.

G. All unfinished ironwork installed under this Division of the Specifications which is exposed to weather shall be painted by Owner.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:
15000 Mechanical General Requirements
15200 Piping General
15210 Piping Plumbing
15220 Piping HVAC

15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15400 Air Distribution

B. Refer to Paint section of the Specifications for additional information regarding paints, finishes, preparation, etc.

1.04 SHOP DRAWINGS:

Submit catalog data, color samples, and other requested data for following:

1. Paints

2. Treatment of galvanized metals

3. Markers

4. Labels

PART 2 PRODUCTS

2.01 PAINT

A. Rust inhibitor paint shall be red chromate base made up in a synthetic resin vehicle.

B. Finish paint where specified shall meet the requirements of another section of the specifications.

2.02 PIPING IDENTIFICATION:

A. All piping, insulated and uninsulated shall be identified as herein specified.

B. Piping systems shall be identified by either stenciling the name of the service or applying plastic pipe markers similar to SetMark custom setmarks as manufactured by Seton.

C. Color of stenciling shall be the identifying color of the service as listed under paragraph 2.02 Paint Schedule.

D. Arrows indicating direction of flow shall be shown next to the pipe identification name.

E. The ANSI Standard recommends that the size of the identification letters and the length of the color field be as follows:

Outside Diameter of Pipe or Covering(in.)	Length of Color Field (in.)	Size of Letters (in.)
3/4 to 1-1/4 (19 to 32 mm)	8 (200 mm)	1/2 (13 mm)
1-1/2 to 2 (28 to 51 mm)	8 (200 mm)	3/4 (19 mm)
2-1/2 to 6 (64 to 150 mm)	12 (300 mm)	1-1/4 (32 mm)

F. Install markings after painting or insulating of pipe has been completed.

PART 3 EXECUTION

3.01 GENERAL

A. Ironwork installed under this Division of the specifications which is exposed to the weather, such as pipes, pipe supports, supporting or stiffening angles for exhaust elbows, exhaust heads, vent pipes, etc., shall be painted with two (2) coats of rust inhibiting paint. Finish paint shall be by Owner.

B. All field finish painting shall be by Owner.

C. All galvanized metals from which paint peels shall be stripped, retreated and repainted at no cost to the contract.

D. All steel pipes shall be painted with a rust inhibitor paint prior to applying insulation.

3.02 PIPE AND VALVE IDENTIFICATION

A. On exposed piping apply identification lettering and flow arrows on 30 foot centers of straight runs, at valve locations, at points where piping enters and leaves a partition, wall, floor or ceiling.

B. Valves:

1. Attach to each valve a 2 inch round brass tag stamped with one (1) inch high designating numbers filled in with black enamel.

2. Securely fasten valve tag to valve spindle or handle with a brass chain.

C. Each trade providing work under this Division shall furnish a typed list of all labeled valves, flow control/measurement devices and similar system components. List shall include tag number, system name, type of device, location, area or equipment served and any other information that will assist owner's maintenance personnel. Copies shall be included with each maintenance manual.

3.03 EQUIPMENT IDENTIFICATION

A. Identify each piece of equipment by its system number and other appropriate designation by stenciling in letters of approved size and wording. Equipment requiring identification shall include: supply and exhaust fans, air conditioning and heating machinery and apparatus, control cabinets, and other equipment as may be directed.

B. Identification numbers and names shown on the contract documents shall be used except as follows:

1. On existing facilities where the existing numbering sequence and identification practices must be followed. Installers providing work under this Division must meet with owner representative prior to final labeling of equipment.

C. As-built documents shall be marked to reflect the labeling and numbering sequences when different from contract documents.

END OF SECTION

SECTION 15200 - PIPING GENERAL - HVAC

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions Division 1 and Section 15000 are part of this section.

B. Examine other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of work under the contract.

1.02 SCOPE OF WORK

A. Provide for each indicated piping system all the required labor, transportation, permits, certifications, shop drawings, etc., Furnish and install all required materials, equipment, apparatus, tools, temporary construction and all other items needed for a complete system which is safe and ready for operation.

B. Project involve the removal and replacement of existing chilled and heating hot water pipes above the roof, including all new supports.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter.

15000 Mechanical General Requirements
15030 Painting Identification
15220 Piping HVAC
15500 Insulation - HVAC

1.04 QUALITY ASSURANCE

A. Materials

Quality and weight of materials furnished and installed shall comply with requirements and specifications of appropriate standards of American Society for Testing and Materials (ASTM).

B. Welding

1. Pipe welding shall comply with the provisions of the latest Revision of the Applicable Code, whether ASME Boiler Construction Code, ASA Code for Pressure Piping, or such state or local requirements as may supersede codes mentioned above.

2. Before any pipe welding is performed, submit a copy of welding procedures specifications together with proof of welder's qualification as outlined and required by the most recent issue of the code having jurisdiction. Welder's certificates, issued within the past five years, shall be submitted for each welder working on the project.

3. Repair or replace any welding work not in accordance with this specifications. Contractor shall, at his own expense and when directed by the engineer, X-RAY randomly selected welds using the services of a certified test laboratory approved by the owner/engineer.

C. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 SHOP DRAWINGS

A. Submit shop drawings for the following items whenever they are shown on the contract documents.

Gate valves.
Globe valves.
Dielectric unions.
Strainers.
Flexible couplings.
Air vents.
Pressure gages.
Thermometers.
Flow meters.
P.T. Plugs

PART 2 PRODUCTS

2.01 PIPING MATERIALS

A. Copper pipe:

1. Copper piping aboveground shall be type 'L' hard drawn copper tubing.

B. Black Steel Pipe:

Black steel pipe shall be Schedule 40 black steel pipe or Schedule 80 seamless black mild steel pipe and shall conform to ASTM A-120 Standard Specification. Elbows shall be long radius. Elbows, tees, reducers, etc. shall be carbon steel grade B.

2.02 VALVES

A. Furnish and install valves specified herein; shown on drawings and/or necessary for control and service of all piping systems and equipment. All valves shall be first quality, of approved manufacturer, be installed with proper clearances for service and operation and shall be tight at the specified test pressure.

B. Each valve shall have the manufacturer's name or brand, the figure or list number and the guaranteed working pressure cast on the body and cast or stamped on the bonnet.

C. Except for special applications, all valves shall be the product of one manufacturer. Valves shall be Jenkins, Lunkenheimer, Walworth, Crane or Centerline. Where figure numbers of one manufacturer are indicated equivalent figure numbers of approved manufacturers can be substituted.

D. All valves to be installed in insulated pipe systems shall have shaft extension to facilitate insulation installation.

2.03 PIPING AND VALVE IDENTIFICATION

A. Refer to Section 15030.

2.04 PIPE SUPPORTS

A. Refer to Architectural Plans.

2.05 INSULATION PROTECTION SHIELDS

A. Provide shields for all supports of insulated pipe. Shields shall be galvanized steel with flared ends.

B. Shields shall cover not less than the bottom 180E of the insulating cover and meet the minimum requirements listed below:

1/4 to 3 inch pipe	18 gauge x 12 inches long
4 and 6 inch pipe	16 gauge x 18 inches long

2.06 ANCHORS

A. Shall be provided at the location shown on the drawings, and shall be strong enough to assure the proper anchoring at those points. Anchors shall be constructed of minimum 3" x 3" x 1/4" angle iron and may be welded or bolted to the pipe.

B. Each end shall be bolted to building structure.

2.07 DIELECTRIC FITTINGS

A. Provide at all connections between copper and ferrous pipe and equipment, dielectric unions or isolation flanges as herein specified.

B. Dielectric threaded union shall be as manufactured by EPCO Sales Company and Capitol.

C. When using flanged connections, a dielectric gasket shall be provided between flanges and plastic sleeves between bolts and flanges.

2.08 STRAINERS

A. Strainers shall be as follows:

1. 2 inch and smaller shall be rated for 250 lbs. PSI-SWP, 400 PSI-WOG, cast iron body(ASTM A-126 GR. B) and have a straight threaded gasketed face cap with a gasket as approved for service. Screens shall be 20 mesh 304 stainless steel. Mueller 11M, Sarco, Yarway or Watts.

2. 2-1/2 inch and larger shall be rated at 125 PSI-WOG. Screens shall be 1/16 perforated 304 stainless steel through 4 inch and 1/8 perforated 304 stainless steel sizes 5 inch and above. Mueller 758, Yarway, or Watts.

2.09 AIR VENTS

A. Provide air vents at high points in piping systems where there is a possibility of air accumulation and where indicated on drawings.

B. Vents shall be a spring key cock all bronze body, with level handle Watson, McDaniel or equal.

2.10 THERMOMETERS

A. Thermometers shall be of the separable socket, adjustable angle type, minimum nine (9) inches long.

B. Thermometers shall be cast aluminum construction with metallic enamel finish and clear acrylic plastic window lens. Stem shall be brass and all fitting sand wells shall be brass. Wells shall have extension neck to extend through pipe insulation when installed on insulated piping system.

C. Filling fluid shall be red appearing mercury easily readable against a white background and temperatures shall be noted in black embossed figures.

D. Stem length shall be in accordance with companion thermometer well but not less than 3-1/2" long.

E. Install so that at least 75% of stem length is in the moving fluid stream. This may require increased length over the 3-1/2" specified above.

F. Range of thermometer shall be selected so that normal operating temperature is at approximate center of scale and highest possible temperature does not exceed full scale.

G. Weiss, Trerice and Dwyer meets this specification.

2.11 THERMOMETER WELLS

A. Provide where indicated brass thermometer wells with cap and chain. Wells shall have extensive neck to extend through pipe insulation where required.

2.12 PRESSURE GAGES

A. Pressure gages shall be minimum 4-1/2" diameter, cast aluminum structure with black finish. Clean glass window shall be mounted on a chrome plated closed type ring.

B. Gages shall be easily readable and have a white dial with black embossed figures, micrometer-type pointer with black finish.

C. Sensing element shall be a Bourdon type tube, silver brazed to tip, 1/4" brass unit. Movement shall be rotary-type, stainless steel with Delrin sector and phosphor bronze bushing. Accuracy shall be 1/2 of one percent of scale range.

D. Scale range upper limit shall be not less than 150%, and not greater than 200% of system operating pressure.

E. Weiss, Trerice, Dwyer, and Winters 300 series meets this specification.

2.13 P.T. PLUGS

A. Where shown on plans, or in lieu of thermometers and pressure gages provide test openings for the insertion of portable pressure and temperature test gages.

B. Test connections shall consist of a threaded reducing tee or welded coupling to receive a test plug consisting of two rubber self closing valves and threaded cap.

C. Provide with each project a test kit including portable thermometer and pressure gauges covering all ranges where test openings are applied.

D. All fittings and gauges shall be as manufactured by Peterson Equipment Co. or Sissco P/T Plugs.

2.14 CIRCUIT SETTERS

A. Furnish and install a calibrated bronze balance valve with provisions for connecting a portable differential pressure meter as shown on plans. Meter connections to register degree of valve opening. Each balance valve to be constructed with internal seals to prevent leakage around rotating element.

B. Each balancing valve shall be constructed for 125 lbs. working pressure at 250°F.

C. Contractor shall furnish owner with one (1) portable differential pressure meter compatible with the circuit setter furnished. All necessary curves and other flow data shall be furnished with instruments.

D. Circuit setters shall be as manufactured by Bell & Gossett, Taco or Gerand.

2.15 FLOW CONTROL VALVES

A. Threaded valves on small sizes (0.5 to 3") and flanged or wafer (3" to 30") shall consist of yellow brass housing (cast iron or steel on flanged or wafer) and stainless steel or nickel plated brass flow control cartridge assembly; valve shall be rated at 300 PSI/250EF.

B. Valve shall have body tag to indicate direction of flow and be permanently marked with flow rate and PSID control range. Provide strainer upstream of valve inlet if it is not provided at apparatus inlet.

C. Automatic, pressure-compensating, flow control valves shall be removable and shall have: (a) inlet and outlet pressure taps for verification of performance; (b) where required, free exchange of cartridges by the manufacturer for 90 days after date of initial installation.

D. Manufacturer shall warrant that the entire system shall automatically be controlled to remain in balance to within $\pm$ 5% of desired flow rates.

E. Flow control cartridge assembly shall be precision ground, all AISI type 300 Series passivated stainless steel; shall be available in four PSID control ranges;

minimum range shall be capable of being activated by less than 2 PSID; shall be capable of controlling flow within ± 5% of rated flow.

F. Manufacturer shall supply certified independent laboratory tests verifying accuracy of performance of all products.

G. Meter kits shall be provided as either a permanently mounted or as a single-hose portable or double-hose portable kit; pressure gauge with 4-1/2" dial shall have range of -15.7 to 150 PSI; portable kits shall be available with end connections for either pressure only or pressure/temperature test valves and shall include carrying cases; all kits shall include flow rate chart for determining flow rate.

H. Identification tags shall be provided for all valves. Tags shall be indelibly marked with flow rate, model number, zone identification; tags shall be 3" x 3" aluminum.

I. P/T adaptor shall include either a pressure or pressure/temperature test valve for measuring the temperature and/or pressure differential across the terminal unit.

J. Approved manufacturer Autoflow and Griswold.

PART 3 EXECUTION

3.01 PIPE AND VALVE IDENTIFICATION

A. Refer to Section 15030 Painting-Identification.

3.02 VALVE CONTROL

A. Valves shall be installed where shown on plans, where necessary to facilitate service of sections of the piping system(s) and at the inlet and outlet connections to all fixtures and equipment.

3.03 STRAINERS

A. Strainers shall be provided in the inlet connections to each control valve and as shown on plans.

B. Strainers shall be so arranged as not to "trap" pipes. Unless otherwise indicated, strainers shall be line size.

C. All strainers shall have removable cylindrical or conical screen of bronze and suitable flanges or tappings to connect with the piping they serve. They shall allow blowing out of accumulated dirt, and removal and replacement of a strainer screen without disconnection of the main piping.

D. Provide valved dirt blow off connections with hose connection for each strainer. Valve shall be located 6" to 1'- 0" below strainer or as directed.

E. During initial cleaning, flushing and testing of piping systems install disposable fine mesh (100) screens at each strainer.

F. Provide required clearance for strainer removal without having to disassemble piping system.

3.04 PIPE JOINTS

A. Clean all pipe and fittings before jointing. Ream the ends of pipe having screwed, welded or soldered joints to remove all burrs after cutting.

B. After threading and/or cutting, swab out the pipe to remove all foreign matter.

C. SCREWED PIPE: All threads must be clean and sharp. Pull joints up tight using an approved joint compound applied to male threads only, except as otherwise specified. Make screwed joints in piping containing hydrocarbons with litharge and glycerine in lieu of red lead joint compound.

D. SOLDERED JOINTS: Make joints as recommended by the solder manufacturer, using solder as indicated.

E. WELDED JOINTS: Electric arc fusion or oxyacetylene welds, using acceptable welding rods. Welding shall be performed by certified welders in accordance with acceptable welding standards.

3.05 CONNECTIONS TO EQUIPMENT

A. On screwed and soldered piping systems provide unions as specified or indicated; at each valve and at each pipe connection to equipment.

B. On welded piping systems provide flanges as specified or indicated; at each valve and at each pipe connection to equipment.

C. Unions or flanges shall be provided at each system component which may need service or replacement.

3.06 AIR VENTS

A. Provide air vents at high points in piping systems and where indicated on drawings.

B. Vents shall be a spring key cock all bronze body, with lever handle Lukenheimer Fig. 174 or equal.

3.07 DRAINAGE

A. Install drain valves with hose connections at low points in piping systems to assure complete system drainage.

B. Drain valves shall also be provided at each coil, heat exchanger, strainer and other pieces of hydronic equipment where drainage for service will be required.

3.08 CLEANING AND TREATING OF PIPING

A. Include the internal cleaning and treating of following piping systems installed under this section.

Heating hot water piping
Chilled water piping

B. Systems shall be filled and flushed with a solution of a non-foaming chemical detergent, to remove all foreign matter. After final filling, the Ph of the water shall not exceed 8.0.

C. Cleaning and flushing of all systems shall be done by the mechanical systems installer under the supervision of the Water Treatment Company. Refer to Section 15320.

D. When the fine mesh strainers are not adequate to remove the particles in suspension, cheese cloth shall be used in conjunction with the strainers.

E. This work shall be deemed complete when circulation has been established throughout all systems, and where water from these systems runs clean, free from all deposits. Submit a report to the architect stating that each of the piping systems are cleaned and treated.

F. When cleaning is completed, the contractor shall replace all fine mesh strainers (100 mesh) used during the cleaning process with standard strainers herein specified.

G. During cleaning and flushing of piping, a temporary bypass shall be provided around each water coil and control valve.

3.09 TEST OF PIPING SYSTEMS

A. The objective of these tests is to prove the adequacy, quality, and safety of all piping systems and assure that operating pressures can be safely maintained.

B. All leaks detected during these tests shall be promptly corrected and piping systems shall then be retested.

C. Furnish necessary instruments, test equipment, water, power, fuel and personnel required for tests, and make provisions for removal of test equipment and draining of pipes after tests have been completed.

D. Contractor shall notify the Architect at least 48 hours in advance of any test that will be ready for observation by the Architect or his designated representative. Failure to comply with this request will not allow the Architect or his representative to properly schedule his visit to the site and the test must remain on until the field observation can be accomplished.

E. In the event the engineer or his designated representative is unable to observe the piping under test, the contractor shall proceed as follows:
Observe all tests and furnish a letter for each test to the architect within 5 days of the test completion certifying that the test was performed. Include the following information.

1. Type of system tested

2. Date of test

3. Test pressure

4. Medium used for test (water, air, etc.)

5. Exact location and extent of system tested.

6. Duration of test.

F. Tests may be performed on partial sections of the system only if the section must be concealed to permit normal progress of the project. The installer shall overlap test sections by one joint for partial tests to insure that all joints are subjected to test. Upon completion of the system, the entire system shall be given a final test and be certified by the contractor.

G. All tests shall be performed and certified by the contractor prior to any painting, insulating or concealment of the piping.

H. Systems shall be tested as described herein except where a local or other applicable code has more stringent requirements, which shall then be followed. Other systems shall be tested as indicated on applicable sections of these specifications.

I. Refer to the Section 15700, Test and Balance, for additional HVAC test requirements.

END OF SECTION

SECTION 15220 - PIPING HVAC

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions Division 1 and of Section 15000 shall apply to all work under this Section.

B. Examine other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE

A. Provide for each indicated piping system all necessary and required labor, transportation, permits, certifications, shop drawings, etc., Furnish and install all required materials, equipment, apparatus, tools, temporary construction and all other items needed for a complete system which is safe and ready for operation..

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter.

15000 Mechanical General Requirements
15500 Insulation - HVAC

1.04 SHOP DRAWINGS

A. Prepare and submit shop drawings for the following items whenever they are shown on the contract documents.

Gate valves.
Globe valves
Check valves
Butterfly valves
Pipe materials
Pipe fittings
Air Separator

PART 2 MATERIALS

2.01 CHILLED WATER PIPING

HEATING HOT WATER PIPING

A. Temperature range: 40°F. to 120°F. (chilled water)
70°F. to 240°F. (heating)

B. Operating pressure: 125 psig maximum

C. Piping materials:

Sizes up to 10 inches: Schedule 40 black steel ASTM A120-68, Grade 3

D. Pipe connections:

2 inches and smaller-threaded

2-1/2 inches and larger-welded

E. Fittings

2 inches and smaller-150 lbs. malleable iron screwed, ASTM A-197.

2-1/2 inches and larger-Schedule 40 welded.

F. Flanges: All sizes, 150lbs. forged steel flat face ASTM A181, Grade 1.

2 inches and smaller-screwed-on type.

2-1/2 inches and larger-slip-on or welding neck.

G. Unions: 150 lbs. malleable iron, screwed, bronze to iron set.

H. Gaskets: 125 lbs., 1/16 inch cloth inserted rubber.

2 inches and smaller-full face with prepunched holes.

2-1/2 inches and larger-ring type.

I. Gate valves

2 inches and smaller-125 lbs. screwed bronze, wedge disc, rising stem, screwed bonnet. Crane No. 428, Nibco No. T-111, Walworth W55, Lunkenheimer No. 2127, or Milwaukee.

2-1/2 inches and larger-flanged type with cast iron body, brass trim, brass seats rising stem and iron wheel 125 psi class. Flanged pattern Crane 465-1/2, Walworth 726F, Stockham G623, Nibco F-617-0, Lunkenheimer No. 1430, Milwaukee or Grinnell.

J. Butterfly valves

Butterfly valves shall have a minimum working pressure rating of 150 psig at 150°F.

2-1/2 through 6 inches: 125 lbs. cast iron body lug type, throttled plate in 10° positions, lever operated, replaceable Buna-N seat, bronze disc stainless steel stem, bolt holes tapped from each side for standard studs, Crane No. 24N-BRB, Nibco No. NL082-3, Lunkenheimer No. 4734, Keystone, Mueller 56ANK3-1, Milwaukee, Centerline or Grinnell.

K. Globe valves:

2 inches and smaller: 125 lbs. screwed bonnet, bronze, composition disc. Crane No. 7, Nibco No. T-211-Y or Lunkenheimer No. 123.

2.02 CONDENSATE DRAIN PIPING

A. Piping material:

1. Copper:

a. Pipe: type L, hard temper copper tube.

b. Fittings: 125 lbs. minimum, wrought or cast copper, socket ends. Reducers and couplings with stop. Traps to be return ends with coupling and extension tubes.

c. Joints: 95/5 solder. The use of acid is prohibited.

PART 3 EXECUTION

3.01 TEST OF PIPING SYSTEM

A. Chilled water piping:
Heating hot water piping:
Test and prove tight at a hydrostatic pressure of 150 psig held for two (2) hours.

3.02 VALVES

A. Chilled water, heating hot water, piping systems.

1. Shutoff Service: Gate valves. Butterfly valves may be used for line sizes 2-1/2" and larger.

2. Throttle/Balancing service: Globe valves. Butterfly valves with memory plates may be used for line sizes 2-1/2" and larger.

3. Valves shall have shaft extension to facilitate insulation installation.

4. Butterfly valves shall have integral flanges or threaded lugs.

3.03 OTHER COMPONENTS

A. Refer to Section 15200, Piping General for specification requirements concerning strainers, hangers, thermometers, pressure gauges, etc. and any other devices required for the system operation, testing, control and balancing.

3.04 INSULATION

A. Refer to Section 15500.

END OF SECTION

SECTION 15300 - AIR SIDE HYDRONIC MECHANICAL EQUIPMENT

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirement of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all work under this section.

B. Examine all other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section.

C. Coordinate work with that of all other trades affecting, or affected by work of this section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE

A. The work under this section shall include furnishing all labor, materials, tools, appliances and equipment, and performing all operations necessary for the complete installation of all heating, ventilating and air conditioning equipment as shown, detailed, and/or scheduled on the drawings, and/or specified in this section of the specifications.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15010 Electrical Power and Auxiliaries
15020 Vibration/Noise Isolation
15030 Painting Identification
15200 Piping General - HVAC
15220 Piping HVAC

1.04 QUALITY ASSURANCE

A. Each piece of equipment shall have manufacturer's name, address, serial and model numbers engraved on a metal plate securely attached to it.

B. Capacities shall be not less than those indicated on plans.

C. Provide certified sound and/or fan data as hereinafter specified and upon request from the Architect/Engineer.

D. All insulation used on equipment shall meet NFPA-90A flame spread and smoke generation requirements.

E. In each air handling unit, the coil and filter sections shall be completely sealed to prevent air bypass around coil and filters.

F. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 SHOP DRAWINGS

Roof Mounted Air Handler

PART 2 PRODUCTS

2.01 ROOF MOUNTED AIR HANDLER UNIT

A. Furnish and install where shown on plans, single zone roof mounted packaged air handler(s) of the size, type and performance as indicated on unit schedule and herein specified. Air handler and fan performance shall be ARI certified. Unit shall be UL listed.

B. All exterior surfaces shall be phosphatized and coated with baked-on enamel and pass a 500 hour salt spray test.

C. Provide gasketed hinged access doors with flush mounted, single lever latching mechanisms. Access each cabinet section from both sides. Gasketing shall provide a positive seal.

D. Unit shall be double wall internally insulated with 2" thick 1 1/2 lb. density glass fiber boards. Secure to side, top and end panels with waterproof adhesive and mechanical fasteners. Insulation shall meet NFPA-90A flame spread and smoke generation requirements. (Insulation fibers must not be exposed to supply air stream).

E. Unit cabinet shall have standing top seam and channeled surfaces at all joining sections. Top panel shall be cross-broken for water drainage. Unit cabinet shall be designed to operate at 1.5 times the total static pressure shown on the schedule.

F. The unit base shall overhang the roof curb and have a formed recess that seats on the roof curb gasketing for positive weathertight seal. Lifting brackets with holes shall be provided on the unit base.

G. Exterior panels shall be constructed of a minimum 16 gauge or heavier galvanized steel. Provide 22 gauge galvanized steel liners on all access doors, side top and bottom panels, (inner wall skin) and over floor insulation.

H. Coil sections (pre-heat, cooling and reheat) shall consist of single or multiple removable coils. The condensate drain pan shall extend beyond the leaving air side of the cooling coil and underneath the coil connections. The stainless steel drain pan shall be insulated. The drain connection shall extend through the unit base. For stacked coils, an intermediate mastic coated drain pan shall be provided with drop tubes on each end.

I. Water coils shall have threaded connections located on the same end. Coil headers, distributors and connections shall be completely enclosed in the unit casing. Vent and drain connections shall be provided on all water coils.

J. Coils shall have copper headers and copper tubes, mechanically bonded to corrugated aluminum finns mounted on a galvanized steel casing. Coils shall be ARI Certified by Standard 4l0-72.

K. Water coils shall be circuited for minimum pressure drop. Test coils at 3l5 lbs. air pressure under warm water and guarantee for l50 PSIG working pressure.

L. Supply fans shall be double width, double inlet centrifugal, forward curved heavy-duty solid single thickness blades. Fans shall be statically and dynamically balanced for quiet operation. Forward curved fan wheel and housing shall be fabricated from painted cold rolled steel. Fan blades shall be continuously welded to the back plate and end rim, in a galvanized steel housing. Fan wheel diameter shall meet AMCA standards for non-overloading fans. Fans shall be mounted on a solid steel shaft with heavy-duty 200,000 hour greaseable ball bearings. First shaft critical speed shall be at least 142% of the fan's maximum operating speed. The entire fan assembly shall be completely internally isolated with double deflection spring isolators.

Belt driven fans shall be provided with adjustable sheave on the motor to allow changes in the fan speed and an increase of up to 30% in the RPM's.

M. Fan motor(s) shall be heavy-duty, open drip-proof, high efficiency type with greaseable ball bearings. Provide variable pitch sheave and mount on an adjustable base for proper alignment and belt tension adjustment.

N. The filter section shall be supplied complete with galvanized steel filter racks. Filters shall be accessible from both sides of the unit.

Panel pre-filters shall be 2" thick throwaway glass fiber type. Face velocities shall not exceed 380 FPM.

Cartridge after filters shall be 65% efficient by the NBS dust spot test.

O. The outside air plenum section shall include an outdoor air hood with integral fully adjustable damper, external adjustment lever, bird screen, and rain lip.

P. Roof Curb shall be a minimum of l2 gauge galvanized steel designed and manufactured by the unit manufacturer. Roof curb shall provide complete perimeter support of the unit, be a minimum l6" high and include a nominal 2" x 4" wood nailer strip. Gasketing shall be provided for field mounting between the unit base and roof curb. The roof curb shall be approved by the National Roofing Contractors Association.

Q. Coil piping vestibule shall be field installed on the heating and cooling coil section, to allow space for coil piping. Vestibule shall be constructed of the same materials as the unit casing, utilizing the access door from the standard coil section.

R. Electrical Requirements:

1. Provide incandescent lights in waterproof enclosures in each access section.

2. Provide minimum of two (2) weatherproof 120V duplex service outlets mounted outside the unit.

3. Provide unit mounted fan(s) starter(s) and disconnects.

4. Provide unit mounted disconnect for lights and service outlets.

5. Provide single point power connection to unit. Main disconnect provided by others.

6. Provide a NEMA I weatherproof cabinet with gasketed hinged doors to house all above listed electrical devices. Provide low voltage (120V) transformer whenever required.

7. All wiring to be in conduit. Conduit and wiring to meet N.E.C. and NFPA 70 requirements. Also refer to requirements of Division 16.

S. Control requirements:

1. Provide empty conduits for control wiring to a point inside electrical panel.
2. Provide empty conduit for the installation of smoke detectors in the supply and return air sections.
3. Control wiring and/or tubing to be provided by others.

T. Approved Manufacturers are McQuay RoofPak, Trane, Carrier.

PART 3 EXECUTION

3.01 EQUIPMENT

A. Each piece of equipment shall be installed in accordance with the approved recommendations of the manufacturer to conform with the contract documents. The installation shall be accomplished by workmen skilled in this type of work.

B. Each piece of equipment shall be installed to be free of noise and vibration. Provide isolators as per manufacturer's recommendations and/or as herein specified.

C. Deliver equipment to the site in manufacturer's original packaging. Clearly mark each item with the proper identification number. Store in accordance with the requirements of Section 15000.

D. Provide extended lubrication tubes and fittings for service of bearings located in concealed or difficult to reach sections of apparatus. Provide additional extensions as directed by Architect/Engineer.

E. Duct turns located near a fan discharge shall always be in the direction of fan rotation. Equipment installer shall coordinate arrangement of fan section to assure this condition is met.

F. In all fan systems, the air quantities shown on the Drawings may be varied as required to secure a maximum temperature variation of 2 degrees within each controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of this Equipment Installer to replace fan drives and/or motors (without cost to the Owner) to attain the specified air volumes in coordination with the Test and Balance Section of this Specification.

3.02 EQUIPMENT PERFORMANCE

A. Performance indicated on schedule(s) is based on the listed equipment manufacturer used as the basis of design. For all other listed manufacturers, shop drawing data shall indicate equal or better performance characteristics as the specified equipment.

END OF SECTION

SECTION 15340 - FANS, VENTS, AND HEATERS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirement of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all work under this section.

B. Examine all other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section.

C. Coordinate work with that of all other trades affecting, or affected by work of this section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE

A. The work under this section shall include furnishing all labor, materials, tools, appliances and equipment, and performing all operations necessary for the complete removal and reinstallation of all existing exhaust fans as shown, detailed, and/or scheduled on the drawings, and/or specified in this section of the specifications.

B. Contractor shall field verify the dimensions of existing fan curbs and provide new replacement curbs, minimum 12 “ high.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15020 Vibration/Noise Isolation

1.04 SHOP DRAWINGS

Exhaust, Return And Supply Fans Curbs.

PART 2 PRODUCTS

2.01 POWER ROOF EXHAUST FAN

A. Provide a pre-fabricated roof curb. Roof curb shall be 12 inches high and match unit furnished.

2.02 RELIEF VENT

A. Unit shall be securely mounted on pre-fabricated roof curb furnished with unit. Curb shall be a minimum of 12 inches high.

PART 3 EXECUTION

3.01 EQUIPMENT

A. Each piece of equipment shall be installed in accordance with the approved recommendations of the manufacturer to conform with the contract documents. The installation shall be accomplished by workmen skilled in this type of work.

B. Each piece of equipment shall be installed to be free of noise and vibration. Provide isolators as per manufacturer's recommendations and/or as herein specified.

C. Deliver curbs to the site in manufacturer's original packaging. Clearly mark each item with the proper identification number. Store in accordance with the requirements of Section 15000.

END OF SECTION

SECTION 15400 - AIR DISTRIBUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions, and of Section 15000 shall apply to all work under this section.

B. Examine other Sections of the specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of other trades affecting, or affected by work of this section. Cooperate with such trades to assure the steady progress of all work under the contract.

1.02 SCOPE

A. Work under this section shall include providing the following:

1. Sheet metal supply air ductwork, round or rectangular from each air handling unit as shown on plans.

2. Supports for all duct systems and duct mounted equipment.

3. Air volume control devices, fire dampers, balancing dampers and flexible connections to all air moving equipment subject to vibration.

4. Labor to operate air systems and make adjustments to achieve complete test and balance in cooperation with work performed under Test and Balance section of this specification.

5. All ductwork indicated on drawings is schematic and shall not be scaled. Therefore changes in duct sizes and/or location may be made where necessary to conform to space conditions without additional cost to the Owner. All duct dimensions are clear inside dimensions.

6. Properly prepare for painting all ductwork and related supports etc. as required by the contract documents. Apply primer and/or treatment as specified.

7. When indicated on drawings, reuse existing ductwork. All new work associated with existing ductwork shall match existing materials and installation.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15010 Electrical Power and Auxiliaries
15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15500 Insulation - HVAC

1.04 QUALITY ASSURANCE

A. The following codes and standards are to be considered a part of this specification to establish quality of materials and labor.

NFPA 90A Installation of Air Conditioning and Ventilation Systems. (1993)

SMACNA HVAC Duct Construction Standards, Metal and Flexible. (1995)

SMACNA Fire Damper and Heat Guide. (1992)

SMACNA HVAC Air Duct Leakage Test Manual. (1985)

UL-181 Air Duct Materials and Air Conditioning.

B. Reference made to the "Manual" shall mean applicable SMACNA Standards as published by Sheet Metal and Air Conditioning Contractors National Association, Inc.

C. Tables, descriptions and drawings in the Manual show methods of fabrication of items such as ductwork, dampers, louvers and air intakes. These methods shall be followed unless manufactured products are specified for these items.

D. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 SHOP DRAWINGS

A. Submit catalog cuts and specification sheets for the following items whenever they are indicated on the contract documents.

Fire Dampers
Flexible Connections
Duct Construction Standards

Dampers
Turning Vanes
Test Reports

B. Submit installation instructions and certified test data for the following devices:

Fire Dampers
Smoke Dampers
Combination Smoke and Fire Dampers
Treatment of galvanized metals to be painted

PART 2 PRODUCTS

2.01 MATERIALS GENERAL

A. Ductwork

1. Galvanized Steel ASTM - A93

B. Duct Sealer

1. Hardcast #601 or approved equal.
2. Flame spread 25 or lower in dry state.
3. Smoke development 50 or lower in dry state.
4. Refer to TABLE 1-2, Standard Duct Sealing Requirements, of the Manual.

2.02 SHEET METAL DUCT SYSTEM

A. Sheet metal ductwork includes but is not limited to:

1. Supply air ducts.

2. Construct pressure duct system in accordance with SMACNA HVAC Duct Construction Standards, Metal and Flexible, (1995) hereinafter referred to as the "Manual."

3. Use the Manual Duct Construction Tables for metal gage, reinforcing type, spacing, and method of fabrication. Indicate on shop drawings.

4. Seal all joints as per Table 1-2. All transverse joints and fitting connections shall be sealed. All "Snaplock" seams to be sealed. Longitudinal seam on the perimeter to be sealed. All screw penetrations shall be sealed. Use sealant as hereinbefore specified under sealants.

5. Ductwork shall be fabricated in accordance with Table 1-15 duct Pressure class ratings 1/2” w.g., 1” w.g., 1” w.g., 2” w.g., 3” w.g., 4” w.g. 6” w.g. or 10” w.g. based upon duct operating pressure obtained on the Equipment Schedule.

6. Rectangular ducts shall be reinforced in accordance with Tables 1-3 through 1-13 of the manual.

B. Supports

1. Supports shall be provided in accordance with Chapter 4 IV of the Manual.

2. Support spacing shall be as shown by tables 4-1 through 4-3.

C. Fittings and Other Construction:

1. Fittings and other construction shall be fabricated in accordance with Chapter 2 of the Manual.

2. Radius elbows shall be constructed with a centerline radius of 1.5 times the duct width. Where a smaller radius or square elbows are used provide turning vanes to produce a pressure drop less than that of an elbow with 1.5 radius.

3. Transitions shall be constructed with no side at a greater angle than 30 degrees from duct centerline on contracting flow, and 22.5 degrees maximum diverging flow. See Fig. 2-7 of the Manual.

4. Volume dampers shall be installed on all branch lines. Dampers shall be fabricated as shown by Figures 2-12 and 2-13 of the Manual.

D. Turning and Splitter Vanes

1. Turning vanes shall be provided in all square elbows. Splitter vanes shall be provided in all duct offsets larger than 15° and radius elbows.

2. Turning vanes shall be constructed as shown by Figures 2-3 and 2-4 of the Manual.

3. Vanes shall be double thickness "airfoil" design, except in ducts 10" or less in depth where single thickness vanes with trailing edges may be used.

2.03 ROOFTOP DUCTWORK SYSTEM

A. All ducts installed exposed to the weather, such as rooftop, shall be galvanized sheet metal construction. Duct construction standards shall be in accordance with the Chapter 5 Manual.

B. All seams and joints shall be sealed water tight.

C. Rectangular gooseneck shall be fabricated in accordance with Figure 5-5 of the Manual.

D. All doors/panels shall be of the hinged type with easily opened locking devices, unless safety or fire rated considerations require otherwise.

E. Doors/panels that are found by the Architect or Owner to be of inadequate size to allow proper access to equipment and other concealed devices shall be promptly replaced at no cost to the contract.

F. Doors/panels that are found by the Architect or Owner to be improperly located with relation to the equipment or concealed devices they serve, shall be relocated at no cost to the contract.

2.04 VIBRATION ISOLATION

A. The intake duct to each fan and the discharge fan duct from each fan, except as noted, shall be broken by a minimum two inch space. Provide a flexible connection of coated 30 oz. glass fabric at least 6" long which will be inserted in this gap and securely attached to the ductwork so as to make air-tight connection. These flexible connections shall be slack and shall not be painted.

B. Prefabricated insulated flexible duct connector similar to Insulfab may be used in lieu of field fabricated connector.

C. Where vibration occurs in ductwork while the system is in operation, the installer shall provide such additional stiffening members as are necessary to overcome this vibration. All ductwork where vibration occurs shall be isolated at points of contact with the building by felt pads neatly and securely held in place. The ductwork at a manually or automatically operated damper and prevent vibration.

2.05 FIRE DAMPERS

A. Fire dampers shall be installed where shown on drawings and as required by the authorities having jurisdiction. Dampers shall be U.L. labeled and tested in accordance with ASTM E-152 and NFPA 252.

B. All dampers shall have the blades out of air stream. Fusible links shall be rated for 165 of unless otherwise noted.

C. Horizontally mounted dampers in vertical ducts shall be spring loaded for horizontal installation.

D. All dampers shall be installed as shown by SMACNA Fire Damper and Heat Guide, 1981. And as per instructions provided by the damper manufacturer.

E. Acceptable manufacturers: Nailor, Prefco, Greenheck, Ruskin, Advanced Air and Air Balance.

PART 3 EXECUTION

3.01 GENERAL

A. Install all system components such as dampers, boxes, electric duct etc. in accordance with manufacturer's installation instructions.

B. The weight of ductwork and accessories shall not be supported by the equipment. Provide additional supports to the floor and/or building structure as required to relieve such weight.

C. Set all equipment properly leveled and aligned with associated ductwork. Do not use the flexible connectors as a method of correcting misalignments or support of any equipment or duct weight.

D. Surface of ducts and accessories that need to be field painted must be left clean, free of oil and grease and properly prepared to accept paint. Failure to properly prepare duct surface may cause paint to peel and this installer will be responsible for repainting at no additional cost to the contract.

3.02 INSTALLATION OF DUCTWORK

A. Install all ductwork in accordance with applicable SMACNA Manual.

B. Provide reinforcing and supports in accordance with applicable SMACNA Manual.

C. Unless otherwise noted on drawings duct dimensions shown on drawings are clear inside dimensions. Overall dimensions of installed ducts shall reflect allowances for acoustical lining, fiberglass boards, etc.

D. Duct dimensions may be changed to meet field conditions as herein before specified.

E. Maintain full free interior duct areas and suitable shapes at all points.

F. Drawings do not show all transitions and offsets which may be required. Install all necessary transitions and offsets to complete system.

G. Field assemble rectangular, round and flat-oval ductwork as follows:

1. Use approved duct sealer applied to slip joints, couplings, etc.
2. Isolate dissimilar metals with elastomeric sealant tape or fiber gaskets, and gaskets and washers for bolts.

3.04 DUCT SUPPORTS

A. All ducts shall be properly supported in accordance with Chapter 5 of the Manual. Spacing between supports shall not exceed the maximum values shown on indicated tables of applicable Manual.

B. No welding or cutting of building structural members shall be permitted without the written approval of the structural engineer.

C. All supports shall be from the building structure. Supports connected to the metal roof deck system will NOT be accepted.

D. All supports shall be from the building structure. On concrete structures, drill and set in place expansion anchors for duct hangers. The use of powder driven anchors is not acceptable.

3.05 FIRE AND SMOKE DAMPERS

A. Install fire, smoke and combination fire/smoke dampers in strict accordance with manufacturers published instructions. Installation shall meet requirements of the U.L. test and listing.

B. The perimeter of smoke damper sleeves angles shall be sealed with an approved, listed caulking.

3.06 CLEANING

A. As installation of ductwork progresses, remove temporary interior braces put in place during erection.

B. All scraps of metal and insulation and other debris shall also be removed from interior of ducts.

C. Remove all grease and dust from exterior of ducts prior to installation of insulation.

END OF SECTION

SECTION 15401 - PLUMBING

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General Terms and Provisions, Special Provisions, Special Conditions of Contract and Technical Specifications.

SUMMARY

This sections includes the following work:

At roof drains, replace all missing domes within areas where roof is being replaced.

This Contractor shall field check for type and size of dome to match existing.

Domes shall be of cast-iron and shall be securely fastened to roof drains. Re-tap for new fasteners is necessary to properly anchor domes.

Roof drains, vertical and horizontal piping, shall be properly cleaned to assure complete free flow of water from surfaces into the storm drainage system.

END OF SECTION

SECTION 15500 - INSULATION - HVAC

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions and of Section 15000 shall apply to all work specified hereinafter.

B. Examine other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section.

C. Coordinate this work with that of other trades affecting, or affected by work of this section. Cooperate with such trades to assure the steady progress of work under the contract.

1.02 SCOPE

A. All ductwork, piping and equipment specified under this section of the Specifications and/or indicated on the drawings that transmits or receives heat, will form condensation, or is subject to freezing shall be insulated unless it is specifically stated otherwise.

B. Ductwork systems to be insulated:

1. Supply air ducts above roof..

2. Other ducts as specified herein or shown on the plans.

C. Piping systems to be insulated:

1. Chilled water lines above roof.

2. Building heating hot water lines above roof.

3. Heat reclaim supply and return lines.

1.03 RELATED DOCUMENTS

A. The following sections of the specifications are included hereinafter:

15000 Mechanical General Requirements
15220 Piping HVAC
15400 Air Distribution

1.04 QUALITY ASSURANCE

A. Insulation materials shall conform to the requirements of NFPA 90A and shall have composite fire and smoke hazard ratings as tested in accordance with ASTM E-84, NFPA 255, or UL 723 not exceeding: Flame Spread 25, Smoke Developed 50.

B. Accessories such as adhesive, mastic, cement, facing, tapes and cloth for fittings, shall have the same component ratings as listed above.

C. Products or their shipping cartons shall bear a label indicating that flame and smoke rating do not exceed above requirements.

D. Any treatment of jackets or facings to impart flame and smoke safely shall be permanent. The use of water soluble treatment is prohibited.

E. All insulation shall be installed in accordance with manufacturer's instructions by skilled workmen regularly engaged in this work.

F. All insulation materials shall be certified to be asbestos free.

G. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

1.05 APPROVED MANUFACTURERS

A. Insulation shall be as manufactured by Schuller, Owens Corning Fiberglas Corp., Armstrong, Pittsburgh Corning, Knauf, and Childers Products Company.

1.06 SHOP DRAWINGS

A. Prepare and submit shop drawings for all insulating materials in accordance with the requirements of the general conditions and the manner described therein.

B. Shop drawings shall indicate Specification Section and Paragraph applicable to product.

C. Include description of manufacturers recommended application/installation procedures if different from what is herein specified.

PART 2 PRODUCTS

2.01 EXPOSED DUCTWORK

A. All exposed rectangular ducts shall be insulated with one and a half inches (1-1/2") thick rigid board insulation.

B. Insulation shall be 6 lbs. per cubic foot density glass fiber with maximum K factor of .24 at 75oF. mean temperature with fire retardant vapor barrier facing. Insulation shall be similar to Owens-Corning Fiberglass Type 705.

C. Insulation shall be secured with Benjamin-Foster 85-20 adhesive and impaled over welded or stick pins applied to duct surfaces on 12" centers in all directions.

D. Use a minimum of two rows of fasteners on each side of duct. Secure insulation with suitable speed washers or clips firmly embedded into insulation.

E. All joints shall be tight. All joints, clips and breaks in the vapor barrier shall be sealed with 3" wide strips of the barrier facing adhered with Benjamin Foster 85-20 adhesive.

F. All corners shall be made up with aluminum roll-on corner beads.

G. All exposed round and oval ducts shall be insulated as hereinbefore specified for concealed ductwork.

2.02 INSULATION FOR OUTDOOR DUCTS

A. Ducts installed outdoor shall be externally insulated with two inches (2") thick Foamglas insulation and then finished with a weatherproofing coating.

B. Insulation shall be 7.5 lbs. per cubic foot phenolic foan with a maximum K factor of 0.29 at 75F mean temperature. Insulation shall have a foil reinforced vapor barrier facing.

C. Insulation shall be impaled over welded pins applied to duct surface on 12" centers in all directions. Use a minimum of two rows of fasteners on each side of duct. Secure insulation with suitable speed washers or clips firmly embedded into insulation.

D. All joints shall be tight. All joints, speed washers and breaks in the vapor barrier shall be sealed with 3" wide strips of the vapor barrier facing adhered with vapor barrier adhesive.

E. The exposed surfaces shall be weather protected with two coats of Childers Pittcote 404 with PC Fabric 79, Insulcoustic Vi-Ac Mastic, I-C 551, Benjamin Foster GPM Mastic with open weave glass cloth membrane imbedded between the coats, or Childers CHIL-PERM WB CP-35 vapor barrier. The total thickness of the coating shall be a minimum of 1/8". All horizontal surfaces shall be sloped when mastics are used to prevent ponding of water.

2.03 CHILLED WATER SUPPLY AND RETURN

A. All chilled water supply and return lines shall be insulated using sectional glass foam having a conductivity no greater than 0.29 at 75°F. and a permeability of 0.00 perm.

B. Insulation wall thickness for glass foam shall be 1-1/2" for pipes up to 4 inches and 2" for pipes 4 inches and larger, except that on all exterior piping; piping in mechanical rooms and other high humidity areas, insulation wall thickness shall be 2" for pipes up to 4" and 2-1/2 for pipes 5" and larger.

C. All exterior piping shall have a weatherproof jacket consisting of 0.016 thick aluminum jacket secured with 1/2 aluminum bands not greater than 12 inches on center.

D. Acceptable manufacturer: Pittsburgh Corning "Foamglas".

E. Pipe sizes 1" and smaller may be insulated using flexible expanded elastomeric plastic tubing with a conductivity no greater than 0.253 at 75°F., and a maximum vapor barrier transmission of 0.02 perm.

1. Wall thickness shall be 3/4 inch for all pipe sizes.

2. When outdoors, all exposed insulation shall be finished with two coats of white Armstrong Armaflex finish paint.

3. Acceptable manufacturers are Armstrong Armaflex AP and Rubatex.

2.04 FITTINGS AND VALVES

A. Where white jacket is used, finish with white vinyl mastic reinforced with white glass fabric.

2.05 HEATING HOT WATER SUPPLY AND RETURN

A. All heating hot water supply and return lines shall be insulated using sectional glass fiber having a conductivity no greater than 0.24 at 80°F. Jacket shall be fire retardant type.

B. All exterior lines shall be insulated as in (A) above and finished with a weatherproof jacket consisting of 0.016 thick aluminum jacket secured with 1/2 inch wide aluminum bands on not greater than 12 inch centers.

C. Insulation wall thickness for glass fiber shall be one (1") for pipes 1/2 inch through 2 inches; 1-1/2 inches thick for pipes 2-1/2 through 8 inches and as specified herein. Insulation thickness for phenolic foam shall be one inch for all sizes.

2.06 ALUMINUM JACKET

A. All insulated chilled water, and building heating hot water outside buildings shall be protected by an aluminum jacket cover as herein specified.

B. Use .016 gauge aluminum jacket. The jacket laps and butt strips shall be secured with adhesive and three (3) bands per section.

C. Jacket shall be continuous and include all elbows and fittings. Use preformed covers for elbows and tees.

PART 3 EXECUTION

3.01 GENERAL

A. Insulation shall be applied on clean dry surfaces, after inspection and release for insulation application by the Architect. Flexible connections shall remain uninsulated until after systems have been started and tested for leaks.

B. Insulation shall be continuous through wall and ceiling openings, sleeves and hangers. Exception will be penetrations of fire rated walls, floors, etc. where requirements of paragraph on fire stopping, Section 15000 Mechanical-General shall apply. Also refer to details on drawings.

C. Provides shields between pipe insulation and supports. Shields shall be as herein specified in another section of the specifications.

D. On lines 2 inch and larger, insulated with fiberglass or other soft insulation material, provide an insert of foamglass insulation between pipe and insulation shield to carry the weight of pipe without crushing insulation. Cover insert with jacket to match adjacent insulation. For cold services, provide vapor barrier.

E. On trapeze hangers, hold down straps shall be 2-piece similar to B-Line Figure B 437. Straps shall not crush insulation and allow for installation of shield between insulation and trapeze.

F. Vapor Barriers: Insulation on cold surfaces where vapor barrier jackets are used shall be applied with a continuous unbroken vapor seal.

G. Supports, anchors, etc., that must be secured directly to cold services shall be insulated and vapor sealed to prevent condensation.

H. Reinsulate any pipes, supports, valves and fittings which show signs of condensation.

I. The use of grey duct tape or similar tapes to seal or secure insulation in place is prohibited.

J. Insulation shall not be applied over code stamps, nameplates, inspections stamps and the like.

K. All piping subject to freezing shall be insulated with twice the insulation thickness specified herein.

3.02 VALVES, FLANGES AND FITTINGS

A. Insulate with same material and thickness as adjoining pipe, using premolded fittings or mitered segments of pipe insulation.

B. When using mitered segments of pipe insulation, contractor shall use thicker pipe insulation to assure that the insulation left after all cuttings are made meets minimum thickness specified for the pipe system.

C. Flanges: Insulate flanges with sectional pipe insulation extending a minimum of 1" beyond the ends of the bolts. Bolt area shall be filled with mineral wool cement.

D. Vapor Barrier: For cold services, vapor seal application shall consist of a layer of open weave glass fabric embedded between two 1/16" thick coats of Benjamin Foster 30-35. Lap glass fabric at least 2" on adjoining insulation.

E. Finish: For cold services shall be as hereinbefore specified for the pipe system.

F. For hot services finish with open weave glass fabric adhered and coated with Benjamin Foster 30-36 applied over a coat of finishing cement. Lap glass fabric at least 2" on adjoining insulation.

G. Premolded Fitting Covers: Zeston's one piece premolded insulated fitting covers shall be used for chilled and cold water piping. Covers shall have all edges sealed with Zeston's vapor barrier adhesive. The circumferential edges shall be wrapped with Zeston's vapor barrier adhesive and covered with Zeston's pressure sensitive tape, which shall extend over the adjacent pipe insulation vapor barrier jacket.

END OF SECTION

SECTION 15700 - TEST AND BALANCE

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions, Supplementary General Conditions Division 1 and Section 15000 are part of this Section.

B. Examine other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of work under the contract.

1.02 SCOPE

A. The Installer shall procure the services of an independent Test and Balance Agency, approved by the Architect, which specializes in the balancing and testing of heating, ventilating, and air conditioning systems. The Agency shall balance, adjust, and test all water circulating and air moving equipment, air distribution and exhaust systems, and temperature control equipment as herein specified. The certified Test and Balance Report shall be submitted to the Architect/Engineer at least one week prior to the scheduled Substantial Completion Inspection. If the report has not been submitted by one week prior to the scheduled inspection, the Substantial Completion Inspection shall be re-scheduled.

B. The Installer shall award the test and balance contract to the Agency as soon as possible to allow them to schedule their work in cooperation with other trades and meet the completion date.

C. The Test and Balance Agency shall be in attendance at the Substantial Completion Inspection for a random test of the values contained in the report.

1.03 RELATED DOCUMENTS

A. Work covered under other sections of the specifications related to testing and balancing include but is not limited to the following:

15000 Mechanical General Requirements
15001 Project Close Out
15220 Piping HVAC
15300 Air Side Hydronic Mechanical Equipment
15340 Fans, Vents and Heaters
15400 Air Distribution

15430 Air Terminal Units

Work performed under the above sections is herein referred to as the Installer. Refer to specific items of work provided by each Installer. Installers shall cooperate with test and balance agency as required during execution of the work under this Section.

B. The Agency shall inspect all work under the above Sections as it relates to work under this Section and report to the Architect and Contractor any deviations from plans and specifications that will affect the performance of the system(s).

1.04 QUALITY ASSURANCE

A. The Test and Balance Agency shall provide proof of having successfully completed at least five projects of similar size and scope. Agency shall be a certified member of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB) and use their approved test and balance procedures.

B. All instruments used for test and balance shall be accurately calibrated within six months of commencing work on this project and maintained in good working order. Provide proof of calibration upon request.

C. Submit qualifications of test and balance agency to Architect for review and approval. Submit proposed test and balance procedures, list of equipment to be used and any other information that will allow the Architect to properly evaluate Agency's capabilities.

D. All readings shall be within +10%/-5% of the values shown on the plans and specifications, shop drawings and manufacturer's literature.

E. Manufacturer's model names and numbers used in this section of the specifications are subject to change per manufacturer's action. Contractor shall therefore verify them with manufacturer's representative before ordering any product or equipment. Immediately notify architect/engineer of any changes.

F. The following agencies, only, will be accepted to perform the test and balance procedures at this project:

General Air Balance
Southern Independent Testing, Inc.
Test and Balance Corporation
The Phoenix Agency
Bay to Bay Balancing

1.05 WARRANTY

A. Provide balancing during winter and summer operation.

1.06 REPORTS

A. Test and Balance Agency shall furnish the Contractor and Architect at the end of each day a list of items that must be repaired or adjusted. Provide a direct copy to the Engineer.

B. All test and balance information shall be compiled in a neat, orderly, itemized format on standard AABC Forms or other approved forms. All test data shall be submitted to the Architect for review. After Architect review comments are satisfied furnish three (3) final sets of the complete final report.

C. Included in the report shall be the following minimum information:

1. Provide on as built documents the final Test and Balance Values adjacent to the specified value.

2. Static pressure readings entering and leaving each supply, return, and exhaust fan. These readings shall be related to fan curves for CFM handled. Provide pressure readings to indicate pressure drops across all components of air handling system, e.g., filter, coils, fan dampers, etc.

3. Motor current readings at each fan, The voltage at the time of readings shall be listed.

4. Entering and leaving pressure at each coil,

5. Entering and leaving temperature at each coil,

1.07 COORDINATION WITH CONTRACTOR AND INSTALLERS

A. The Test and Balance Agency shall act on behalf of the Contractor and inspect the installation of pipe systems, sheet metal work, temperature controls and other components and parts of the heating, air conditioning, and ventilating systems. The inspection of the work will cover that part related to proper arrangement and adequate provisions for testing and balancing.

B. The test and balance agency will not instruct or direct the Contractor in any work, but will provide him with reports of his findings with copy to the Architect. The Plans and Specifications have indicated valves, dampers and miscellaneous adjustment devices for the purpose of obtaining optimum operating conditions. Dampers as required by Test and Balance Agency to

achieve design air flows shall be provided by the contractor at no additional cost to the owner. It will be the responsibility of the Contractor to install these devices in a manner that leaves them accessible and adjustable. The Test and Balance Agency should be consulted if there are any questions concerning the arrangement and access to any control devices.

C. The controls installer shall initially set, adjust, relocate(if necessary), and calibrate all controls. The test and balance agency shall verify proper operation of controls. Include in the report one week prior to the Substantial Completion Inspection a statement that all controls have been tested for proper operation in accordance with the Sequence of Operation and design intent.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.01 GENERAL

A. Balance and testing shall not begin until systems have been completed and are in full working order. Installer shall make all preliminary tests and adjustments, place all systems and equipment in full operation and maintain them in operation during each working day of testing and balancing.

B. Installer shall promptly correct all deficiencies noted by the Test and Balance Agency so as not to delay the completion of the test and balance work.

C. All air filters and strainers shall be cleaned or replaced by installer before test and balance work starts and thereafter as required by the Test and Balance Agency.

D. The test and balance agency shall be responsible for inspecting, adjusting, balancing, and logging the data on the performance of fans, dampers, air distribution devices and the water flows through all coils. The Contractor and supplier for the equipment shall cooperate to provide all necessary data on the design and proper application of the components, and shall furnish all labor and material required to eliminate deficiencies.

E. During balancing, the temperature controls shall be adjusted and calibrated by the control manufacturer. The correctness of the final setting shall be proved by taking hourly readings in a typical zone to assure the total variation does not exceed 2 degrees from the median temperature.

F. In all fan systems, the air quantities shown on the Drawings may be varied as required to secure a maximum temperature variation of 2 degrees within each

controlled space, but the total air quantity indicated for each zone must be obtained. The contractor shall replace fan drives and/or motors (without cost to the Owner) to attain the specified air volumes. After Test and Balance completion, the contractor shall install fixed sheaves to deliver the required air quantities. Adjustable sheaves shall be turned over to the Owner and a receipt obtained.

G. In all fan systems, the air quantities shown on the Drawings may be varied as required to secure a maximum temperature variation of 2 degrees within each controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Air Handling Equipment Installer to replace fan drives and/or motors (without cost to the Owner) to attain the specified air volumes.

END OF SECTION

PART E - BID PROPOSAL REPLACEMENT OF BUILT-UP ROOF (BUR) AND ROOF TOP HVAC UNITS BID NO. 18-99

The undersigned understands that this Bid Proposal **must be signed** in ink and that the **unsigned** Bid Proposal will be considered incomplete and subject to rejection by the Hillsborough County Sheriff's Office.

SUBJECT TO DEVIATIONS STATED BELOW, THE UNDERSIGNED, BY THE SIGNATURE EVIDENCED, REPRESENTS THAT THE BIDDER ACCEPTS THE TERMS, CONDITIONS, MANDATES, AND OTHER PROVISIONS OF THE FOREGOING GENERAL TERMS AND CONDITIONS (PART A), THE SPECIAL PROVISIONS (PART B), THE SPECIAL CONDITIONS OF CONTRACT (PART C), THE TECHNICAL SPECIFICATIONS (PART D), AND THE ATTACHMENT DRAWINGS, SAID DOCUMENTS BEING THE STRICT BASIS UPON WHICH THE SAID BIDDER MAKES THIS PROPOSAL.

* * * USE INK ONLY * * *

ALL THE FOLLOWING INFORMATION MUST BE HEREUPON GIVEN FOR THIS BID PROPOSAL TO BE CONSIDERED BY THE HILLSBOROUGH COUNTY SHERIFF'S OFFICE

EXCEPTIONS TO BID: NOTES - ANY REPRESENTATION (BELOW) OR EXCEPTION(S) MAY CAUSE THIS BID PROPOSAL TO BE REJECTED BY THE HILLSBOROUGH COUNTY SHERIFF'S OFFICE. **ALL BIDDERS SHOULD CAREFULLY READ PARAGRAPH 30 OF THE SPECIAL PROVISIONS (PART B)**.

1. The following represents every deviation (itemized by number) to the foregoing General Terms and Provisions (Part A), the Special Conditions (Part B), the Special Conditions of Contract (Part C), the Technical Specifications (Part D), and the Attachment Drawings, upon which this Bid Proposal is based, to wit (provide additional pages if necessary):

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2. - BID PROPOSAL REPLACEMENT OF BUILT UP ROOF (BUR) AND ROOF TOP HVAC UNITS BID NO. 18-99

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The undersigned Bidder, having carefully examined the conditions affecting the Work, the General Terms and Provisions, the Special Provisions, the Special Conditions of Contract and the Contract Documents for:

REPLACEMENT OF BUILT-UP ROOF (BUR) AND ROOF TOP HVAC UNITS, as prepared by Ranon & Partners, Inc., architects and the Hillsborough County Sheriff's Office, does hereby propose to furnish all labor, materials, equipment and services required for the proper execution and completion of the work described and called for in said Documents for the Lump Sum of:

_____

_____ Dollars ($_____).

This proposal covers all expenses, including applicable license fees and all taxes levied in connection with the Work.

The undersigned Bidder agrees that if awarded the Contract for the Work, to substantially complete the work within 160 calendar days, Sundays and Holidays included, such time to commence on the date the Owner's "Notice to Proceed"; and further agrees that from the compensation otherwise to be paid, the Owner may deduct liquidated damages in the amount of $250.00 per calendar day; and that these sums are agreed upon as a proper measure of the liquidated damages that the Owner will suffer by the failure of the Work to be completed within the agreed upon times and that they are not construed as penalty.

The undersigned bidder further agrees that if awarded the contract for the Work and the Bidder refuses to enter into contract with the Sheriff's Office or if the Bidder fails to furnish the required Performance and Labor/Material Payment Bonds, the amount of the Bid Security will be forfeited to the Sheriff's Office as liquidated damages.

Receipt of the following Addenda are hereby acknowledged: (List all Addenda as follows):

ADDENDUM NO. _____ dated_____.
ADDENDUM NO. _____ dated_____.
ADDENDUM NO. _____ dated_____.
ADDENDUM NO. _____ dated_____.
ADDENDUM NO. _____ dated_____.

PRELIMINARY SUB-CONTRACTORS AND MATERIAL SUPPLIERS

1. Firm Name _____

Contact _____

Title _____

Mailing Address_____

Phone (_____)_____

Type of Service/Product_____

2. Firm Name _____

Contact _____

Title _____

Mailing Address_____

Phone (_____)_____

Type of Service/Product_____

3. Firm Name _____

Contact _____

Title _____

Mailing Address_____

Phone (_____)_____

Type of Service/Product_____

4. Firm Name _____

Contact _____

Title _____

Mailing Address_____

Phone (_____)_____

Type of Service/Product_____

REFERENCE LIST

Contractors shall provide business references on this form. References shall be previous installations completed and in operation.

1. Firm Name _____

   Contact _____

   Title _____

   Mailing Address_____

   Phone (_____)_____

2. Firm Name _____

   Contact _____

   Title _____

   Mailing Address_____

   Phone (_____)_____

3. Firm Name _____

   Contact _____

   Title _____

   Mailing Address_____

   Phone (_____)_____

4. Firm Name _____

   Contact _____

   Title _____

   Mailing Address_____

   Phone (_____)_____

BID TITLE: REPLACEMENT OF BUILT UP ROOF (BUR) AND ROOF TOP HVAC UNITS BID NO. 18-99

3. VENDOR:

Check One: ( ) Proprietorship
( ) Partnership
( ) Corporation

FEDERAL TAXPAYER ID NUMBER _____

WAREHOUSE ADDRESS IF DIFFERENT FROM ABOVE:

_____

_____

TELEPHONE NUMBER FOR PLACING ORDERS: (_____)_____
FAX NUMBER FOR PLACING ORDERS: (_____)_____
CONTACT PERSON:_____
OUR COMPANY HAS BEEN IN BUSINESS UNDER ITS PRESENT NAME SINCE:_____

At this present time we understand all requirements and state that as a serious bidder we will comply with all the stipulations included in the bid package.

The above named Bidder affirms and declares:

1. that the Bidder is of lawful age and that no other person, firm or corporation has any interest in this proposal or in the contract proposed to be entered into;

2. that this proposal is made without any understanding, agreement, or connection with any other person, firm or corporation making a proposal for the same purpose, and is in all respects fair and without collusion or fraud;

3. that the Bidder is not in arrears to Hillsborough County or the Sheriff upon debt or contract and is not a defaulter, as surety or otherwise, upon any obligation to the Sheriff;

4. that no officer or employee or person whose salary is payable in whole or in part from the County Treasury is, shall be or become interested, directly or indirectly, surety or otherwise in this proposal; in the performance of the contract; in the supplies, materials, equipment, and work or labor to which they relate; or in any portion of the profits thereof.

The undersigned agrees that this bid shall remain open for an evaluation period of forty-five (45) calendar days following the opening of bids.

Respectfully submitted,

PLEASE PRINT-By_____

Title_____

Date_____

Signature_____

STATEMENT OF NO BID

NOTE: If you do not intend to bid on this requirement, please return this form immediately to:

HILLSBOROUGH COUNTY SHERIFF
FISCAL DIVISION
P.O. BOX 3371
TAMPA, FL 33601

We, the undersigned, have declined to bid on your Bid No. 18-99 for Replacement of Built Up Roof (BUR) and Roof Top HVAC Units for the following reasons:

_____Specifications too "tight", i.e., geared toward one brand or manufacturer only (explain below).

_____Insufficient time to respond to the Invitation for Bid.

_____We do not offer this product or an equivalent.

_____Our Product schedule would not permit us to perform.

_____Unable to meet specifications.

_____Unable to meet Bond Requirements.

_____Specifications unclear (explain below).

_____Remove our company from your bid list.

_____Other (specify below)

_____

_____

We understand that if the "no bid" letter is not executed and returned, our name may be deleted from the list of qualified bidders for the Hillsborough County Sheriff's Office.

PLEASE PRINT

COMPANY NAME_____

COMPANY OFFICER_____

TELEPHONE NUMBER_____

DATE_____

SIGNATURE_____