# CITY OF SANIBEL

## SPECIFICATIONS FOR

## CITY HALL FINANCE & IT WING HVAC REPLACEMENT

## ITB-PW-2-2026/SK

**November 3,2025**

*Public Works Department*
*800 Dunlop Road, Sanibel, FL 33957*
*(239)472-6397*

**BIDS DUE BY:** **2:30 PM on December 4, 2025**

**PRE-BID CONFERENCE:** **NONE**

**NO QUESTIONS WILL BE ACCEPTED AFTER:** **5:00 PM, (ET) November 23, 2025 all questions must be submitted in writing to brett.schira@mysanibel.com and received by stated time.**

**SEALED ENVELOPES MUST BE MARKED WITH THE TITLE OF THE BID, BID NUMBER, NAME AND ADDRESS OF THE BIDDER.**

**Courier Packages (FedEx, UPS) shall clearly state on the outer packaging, the Invitation to Bid Title and the Invitation to Bid Number. If the proper information is not on the courier's outer packaging the Bid/RFP may be sent back to the Vendor without being opened and/or given consideration for that project.**

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CITY OF SANIBEL, FLORIDA

ADVERTISEMENT FOR BIDS

Legal Notice is hereby given that sealed proposals will be received at the Office of the City Procurement Manager, City of Sanibel, Florida, at the Public Works Building, 800 Dunlop Road, Sanibel, until **2:30 P.M.**, on **DECEMBER 4, 2025** and shortly thereafter will be publicly opened and read aloud. Any proposal offered later than the above time will be returned unopened.

The work for which proposals are to be received consists of the following:

**CITY HALL FINANCE & IT WING HVAC SYSTEM REPLACEMENT:**

This work consists of **existing air conditioning system removal and replacement.**

Proposals shall be properly and completely executed on a standard proposal form. Each proposal shall be accompanied by an acceptable certified check or cashier's check made payable to the City of Sanibel, or an acceptable Bidders Bond, in an amount not less than five percent (5%) of the total bid price.

The Contractor to whom the work is awarded will be required to furnish an acceptable Surety Bond in an amount of one hundred percent (l00%) of the contract price.

No bidder may withdraw his proposal within a period of sixty (60) days following the date set for receiving proposals. The City of Sanibel reserves the right to hold any and all bids for a period of not more than sixty (60) days and said bids shall be and remain valid and in full force and effect during said period. The City of Sanibel reserves the right to reject any and all proposals and to waive informalities.

Plans and Specifications for the work may be obtained online at:

https://www.mysanibel.com/297/City-Bids

AFFIDAVIT REQUESTED
PUBLISH ONE TIME
Fort Myers News-Press
**November 3, 2025**

# INFORMATION FOR BIDDERS

## 1.01 SCOPE

A. The contract work provides for the **City Hall Finance & IT Wing HVAC Replacement Project** and other related items pertinent and incidental thereto including the furnishing of all labor, materials, supplies, equipment, work and services, ready for satisfactory and continuous operation, in accordance with the drawings and specifications.

B. The work included in this contract is described briefly as follows:

**Removal and replacement of existing HVAC system.**

Construction is scheduled to begin **JANUARY 2026.**

## 1.02 CONTRACT DOCUMENTS AND SPECIFICATIONS

A. Work to be performed shall be in accordance with drawings and specifications prepared by Weston & Sampson and the City of Sanibel.

## 1.03 BIDDER TO EXAMINE SITE

A. All bidders are to inform themselves of the conditions under which the work is to be performed, the site of the work, the obstacles which may be encountered, and all other relevant matters concerning the work to be performed. The successful bidder will not be allowed any extra compensation by reason of any matter or thing concerning which said bidder might have fully informed themself because of their failure to have so informed themself prior to the bidding.

## 1.04 INFORMATION NOT GUARANTEED

A. All information given relating to borings, material encountered, and groundwater is from the reports of the boring CONTRACTOR. Such information is furnished only for the information and convenience of the bidders. It is understood and agreed that the OWNER does not warrant or guarantee as to the accuracy or completeness of such information. Each bidder must satisfy themself regarding the character, quantities, and conditions of the various materials and work to be done.

B. It is further understood and agreed that the bidder or the CONTRACTOR will not use any information made available to themself or obtained by any examination made by them in any manner as a basis or ground of claim or demand of any nature against the OWNER arising from or by reason of any variance which may exist between the information offered and the actual materials and structures encountered during the construction work.

## 1.05 QUESTIONS REGARDING CONTRACT DOCUMENTS

A. In general, no answer will be given in reply to an oral question if the question involves an interpretation of the intent or meaning of the drawings or contract documents, or the equality or use of products or methods other than those definitely designated or described on the drawings or in the specifications. Any information given to bidders other than by means of the drawings and contract documents or by addenda as described below is given informally and shall not be used as the basis of a claim against the OWNER or the Engineer.

B. To receive consideration, such questions shall be submitted in writing to the OWNER at least **TEN (10)** days before the advertised date for receipt of bids. If the question involves equality or use of products or methods, it must be accompanied by drawings, specifications, or other data, in sufficient detail to enable the OWNER to determine the equality or suitability of the product or method. In general, the OWNER will neither approve nor disapprove particular products prior to the opening of the bids; such products will be considered when offered by the CONTRACTOR for incorporation into the work.

C. The OWNER will arrange as addenda, which shall become a part of the Contract, all questions received as above provided, with his decision regarding each. Addenda will be posted at least **FIVE (5)** days prior to the receipt of bids. It shall be the responsibility of the CONTRACTOR, prior to submitting a proposal, to check the Demandstar online marketplace to download any and all addenda associated with the project. CONTRACTOR shall acknowledge issued addenda on Proposal document page (P-2).

D. Unless such action shall have been taken by the CONTRACTOR and approval obtained, he agrees to use the product or method designated or described in the specifications or as amended by these addenda.

## 1.06 PROPOSAL FORM

A. All bids must be submitted upon the Proposal Form which will be furnished by the OWNER. The Proposal Form shall be completely executed and shall give the price bid for each item of work proposed, both in words and figures, and shall be signed by the bidder.

B. In the event of a discrepancy between the prices written in words and prices written in figures, the prices written in words shall govern.

C. The successful bidder shall be prepared to complete the work within **FORTY-FIVE (45)** Calendar days.

## 1.07 LETTER FROM SURETY

A. The CONTRACTOR shall submit with their executed bid proposal a letter or statement from their surety company that it will execute and deliver a one hundred percent (100%) Performance and Payment Bond.

## 1.08 AWARD OF CONTRACT

A. Lump Sum Proposals - The award of Contract shall be made to the low, responsive and responsible bidder on the lump sum proposals submitted for the work except as provided in for in 1.23 LOCAL PREFERENCE. The Contract shall be deemed as having been awarded

when formal notice shall have been served upon the successful bidder by an officer or agent of the OWNER duly authorized to give such notice.

B. Unit Price Proposals

(1) The award of the Contract will be made to the lowest responsible bidder on the total bid price given on the Proposal Form, page P-1 except as provided in for in 1.23 LOCAL PREFERENCE. The Contract shall be deemed as having been awarded when formal notice shall have been served upon the successful bidder by an officer or agent of the OWNER duly authorized to give such notice.

(2) The quantities listed in the unit price proposal form are to be considered as approximate and are to be used for the comparison of bids only. The unit prices to be tendered by the bidders are to be tendered expressly for the scheduled quantities, as they may be increased or decreased as hereinafter provided. Payments, except for lump sum items in the unit price Contract, will be made to the CONTRACTOR for the actual quantities of work performed or materials furnished in accordance with the plans and specifications; and it is understood that the scheduled quantities of work to be done and materials to be furnished may each be increased or diminished as hereinbefore provided without in any way invalidating the unit price bid. Where there is a conflict between the unit price and the extension thereof made by the bidder, the unit price shall govern, and the Engineer shall be authorized to make a correct extension of such unit bid price and to use such corrected extension in comparing bids.

(3) When bids are requested on "Alternate" items, the City reserves the right to select the lowest responsible bidder based upon either the base bid or the base bid with any or all of the alternate bid prices.

(4) The City reserves the right to accept or reject any or all bids and to waive any formal irregularities in the bids, when deemed to be in the best interest of the City.

## 1.09 BID SECURITY

A. Each bid shall be accompanied by a cashier's check made payable to the OWNER or an acceptable bidder's bond in an amount of not less than five percent (5%) of the total bid price. The checks will be returned to all except the three lowest formal bidders within three days after the date of opening the bids. Any checks remaining with the OWNER shall be returned upon execution of a contract.

## 1.10 COMPARISON OF BIDS

A. Bids will be compared on the basis of the lump sum bid or the sum of unit price extensions plus the sum determined in evaluating the time of completion stated by the bidders in their proposals if the OWNER desires to make such evaluation. The net sum thus obtained shall be used to determine the order of bidding.

B. The sum to be used for evaluation of the time of completion stated by the bidder, if used, shall be only for comparison of bids. It shall be the product of $300.00 and the number of calendar days named by the bidder.

## 1.11 EXPERIENCE AND ABILITY OF CONTRACTOR

A. It is the intent of the OWNER not to award the Contract to any bidder who does not furnish satisfactory evidence they have the ability and experience in this class of work, and that they have sufficient capital and plant to enable them to prosecute the same successfully and to complete it in the time named in the proposal. CONTRACTOR shall have a minimum of **FIVE (5)** years' experience with similar projects.

## 1.12 EXECUTION OF CONTRACT

A. The successful bidder to whom the Contract is awarded shall be required to execute **three (3)** copies of the Construction Contract and **three (3)** copies of the Performance and Payment Bond.

## 1.13 FORFEITURE OF BID SECURITY

A. In the event that the party to whom the Contract is awarded shall fail or neglect to execute the Contract and furnish satisfactory bonds within TEN (10) days after the OWNER has notified him that the Contract is ready for execution, the OWNER may determine that the bidder abandoned the Contract, and thereupon the proposal and acceptance shall be null and void; and the security accompanying the proposal shall be forfeited to and retained by the OWNER as liquidated damages for such failure and neglect, and to indemnify the OWNER for any loss which may be sustained by failure of the bidder to execute the Contract. After the execution of the Contract and the acceptance of the bonds by the OWNER, the bid securities which have been retained by the OWNER shall be returned to the respective bidders.

## 1.14 UNAVAILABILITY OF MATERIALS

A. Bids must be based on use of the materials specified, subject to the provisions of any addenda issued. If the CONTRACTOR is unable to furnish or use any of the materials or equipment specified because of any order by a governmental agency limiting the manufacture or use, or because of the supply situation in the general market for such material or equipment, the CONTRACTOR shall offer substitutes therefor. The substitutes shall be suitable for the purpose, considering the factors of quality, serviceability, appearance, and maintenance. No substitute shall be used until it has been approved by the Engineer.

B. No consideration will be given to the use of substitutes on account of market conditions unless the CONTRACTOR demonstrates that for the item in question, CONTRACTOR placed their order and submitted shop drawings without delay, that CONTRACTOR has shown due diligence in attempting to locate the item as specified, and that the unavailability is due to market conditions in general throughout the particular industry.

C. If substitutes are used in the work, the compensation to be paid to the CONTRACTOR shall be subject to review and adjustment. As a general principle, if the Engineer shall determine that the substitute will be less satisfactory, the CONTRACTOR shall allow a credit to the OWNER; only "under unusual circumstances shall there be an increase in" compensation to

the CONTRACTOR on account of substitution. The basis upon which the amount of price adjustments will be founded shall be the cost of the appropriate items at the time the bids were opened.

## 1.15 LOCAL LABOR AND MATERIALS

A. Whenever possible, the CONTRACTOR, their sub-contractors, material personnel, or others who employ labor, shall employ such labor locally.

## 1.16 NONDISCRIMINATION IN EMPLOYMENT

A. Contracts for work under this proposal may obligate the CONTRACTOR and sub-contractors not to discriminate in employment practices.

B. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

## 1.17 RIGHT-OF-ACCESS

A. The CONTRACTOR agrees that a representative of the OWNER or Engineer will have access to the work wherever it is in preparation of progress and that the CONTRACTOR will provide facilities for such access and inspection.

## 1.18 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

A. The successful bidder shall be responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction."

## 1.19 UTILITIES

A. All existing utility systems which conflict with the construction of the work herein shall be relocated or temporarily removed and replaced as required. Such relocating or temporary removal and replacement shall be accomplished at the expense of the CONTRACTOR, and the work shall be done by the Utility unless the Utility approves in writing that the work may be done by the CONTRACTOR.

B. The CONTRACTOR shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light required for the construction of this Contract during its entire progress. CONTRACTOR shall provide and pay for all temporary wiring, switches, connections and meters.

## 1.20 EASEMENTS

A. The OWNER will obtain right-of-way easements over and through certain private lands for the construction and rehabilitation. The width or limits of such rights-of-way will be defined by the OWNER before the work or construction shall begin. If the methods of construction

employed by the CONTRACTOR are such as to require the use of land beyond the limits obtained, CONTRACTOR shall make their own agreements with the property owners affected for the use of such additional land and submit a copy of the agreement to the "owner".

B. In all such easement rights-of-way, the CONTRACTOR shall be required to carefully remove the Owner's fences, or other obstacles to the construction procedure, and replace the same after the work is installed. The backfilling shall be to the grade of the existing ground level or to the grade as established by the Owner in the event the Owner permits the deposit of excess material upon such land.

C. The cost of all such restoration of property shall be included and no additional payment will be allowed for this work.

## 1.21 OPERATIONS WITHIN RIGHT-OF-WAY

A. In public thoroughfares, all operations of the CONTRACTOR, including those of temporary nature, must be confined within the applicable right-of-way limits. If the methods of the construction employed by the CONTRACTOR are such as to require the use of land beyond the public thoroughfares, CONTRACTOR shall make their own agreements with the property owners affected for the use of such additional land and submit a copy of the agreement to the "owner".

## 1.22 PUBLIC RECORDS

A. OWNER is a public agency subject to Chapter 119, Florida Statutes, the Public Records Law. As a CONTRACTOR or service provider to OWNER, CONTRACTOR is also subject to the Public Records Law pursuant to Section 119.0701, Florida Statutes, and shall comply with Florida's Public Records Law. Unless specifically exempted by Florida law, in whole or part, the CONTRACTOR shall:

(1) Keep and maintain public records required by the OWNER in order to perform the service. This shall include all records relating to CONTRACTOR'S services provided to the OWNER and includes "all documents, papers, letters, maps, books, tapes, photographs, films, sound recordings, data processing software, or other material, regardless of the physical form, characteristics or means of transmission."

(2) Upon request from the OWNER'S custodian of public records, provide the OWNER with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

(3) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the CONTRACTOR does not transfer the records to the OWNER.

(4) Upon completion of the contract, transfer, at no cost to the OWNER, all public records in possession of the CONTRACTOR, or keep and maintain public records required by the

OWNER to perform the service. If the CONTRACTOR transfers all public records to the OWNER upon completion of the contract, the CONTRACTOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the CONTRACTOR keeps and maintains public records upon completion of the contract, the CONTRACTOR shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the OWNER, upon request from the OWNER'S custodian of public records, in a format that is compatible with the information technology systems of the OWNER.

B. As required by Section 119.0701(2)(a), the following contact information is provided to the CONTRACTOR in the format required by statute:

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:**

**SANIBEL CITY CLERK**
**800 DUNLOP ROAD**
**SANIBEL, FLORIDA 33957**
**(239) 472-3700**
**scotty.kelly@mysanibel.com**

## 1.23 DELETED

## 1.24 E-Verify

A. In compliance with Section 448.095, Fla. Stat., CONTRACTOR and its sub-contractor must be registered with and use the E-Verify system to verify work authorization status of all employees hired after January 1, 2021.

(1) CONTRACTOR shall require each of its sub-contractors to provide CONTRACTOR with an affidavit stating that the sub-contractor does not employ, contract with, or sub-contract with an unauthorized alien. CONTRACTOR shall maintain a copy of the sub-contractor's affidavit as part of and pursuant to the records retention requirements of this Agreement.

(2) The OWNER, CONTRACTOR, or any sub-contractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated Section 448.09(1), Fla. Stat. or the provisions of this section shall terminate the contract with the person or entity.

(3) The OWNER, upon good faith belief that a sub-contractor knowingly violated the provisions of this section, but CONTRACTOR otherwise complied, shall promptly notify CONTRACTOR, and CONTRACTOR shall immediately terminate the contract with the sub-contractor.

(4) A contract terminated under the provisions of this section is not a breach of contract and may not be considered such. Any contract termination under the provisions of this section may be challenged pursuant to Section 448.095(2)(d), Fla. Stat. CONTRACTOR acknowledges that upon termination of this Agreement by the OWNER for a violation of this section by CONTRACTOR, CONTRACTOR may not be awarded a public contract for at least one (1) year. CONTRACTOR further acknowledges that CONTRACTOR is

liable for any additional costs incurred by the OWNER as a result of termination of any contract for a violation of this section.

(5) Subcontracts. CONTRACTOR or sub-contractor shall insert in any subcontracts the clauses set forth in this section, including this subsection, requiring the sub-contractor to include these clauses in any lower tier subcontracts. CONTRACTOR shall be responsible for compliance by any sub-contractor or lower tier sub-contractor with the clauses set forth in this section.

# PROPOSAL

## CITY OF SANIBEL, FLORIDA

## City Hall Finance & IT Wing HVAC Replacement Project
**December 4, 2025 @ 2:30PM**

TO: CITY OF SANIBEL
Public Works Department
750 Dunlop Rd.
SANIBEL, FLORIDA 33957

Pursuant to the advertisement for bids, the undersigned having read the Specifications and examined the Drawings prepared by the City of Sanibel and Weston & Sampson for the **City Hall Finance & IT Wing HVAC Replacement Project** in the City of Sanibel, Florida, and having inspected the site of work and conditions affecting and governing same, hereby proposes to provide all materials, and all equipment, tools, etc., and to perform all labor necessary for the installation as specified and described in said Specifications.

The Total Bid Price for the work based on the summation of the extensions of the unit prices on the attached itemized proposal is:

_____Dollars ($_____)
(written)

TIME OF COMPLETION

The undersigned further agrees to complete the furnishings and construction of such work, ready for continuous and satisfactory operation in all respects, within **FORTY-FIVE (45)** calendar days of the Notice to Proceed.

TIME OF VALIDITY

It is hereby agreed that this proposal shall remain in full force and effect and may not be withdrawn for a period of sixty (60) days from the date of receiving proposals by the City of Sanibel.

BID SECURITY

The undersigned encloses herewith a certified check or cashier's check payable to the City of Sanibel, Florida or a bidder's bond bonding the undersigned and surety to the City of Sanibel, Florida in an amount not less than five percent (5%) of the total bid price as set out above, guaranteeing that the undersigned will enter into contract for the performance of the work if this proposal is accepted. It is hereby agreed that this proposal shall remain in full force and effect and may not be withdrawn for a period of sixty (60) days from the date of receiving proposals by the City of Sanibel, Florida.

ADDENDA

Receipt of Addenda Nos. _____ is hereby acknowledged.

Respectfully submitted,

_____
Contractor

(Individual___), (Partnership___) or (Corporation___)

(SEAL)

Signed _____

Name (print) _____

Title _____

Address _____

City / State _____

Telephone _____

Fax _____

Email _____

DATE:

_____

NOTE: The legal status of the bidder, whether as an individual, partnership or corporation, must be indicated above, and all pertinent information as required of the Specifications must be furnished.

## CITY OF SANIBEL

## CITY HALL FINANCE IT WING HVAC REPLACEMENT

**BID OPENING**
**December 4, 2025 @ 2:30p.m.**

***PAY ITEMS***

| Item No. | Quantity | Unit | Description | Unit Price (Words) | Unit Price $ (Figures) | Extended Price $ (Figures) |
|---|---|---|---|---|---|---|
| 1 | 1 | LS | Mobilization | | $ | $ |
| 2 | 1 | LS | Demobilization | | $ | $ |
| 3 | 306 | SF | Remove and replace bathroom ceiling | | $ | $ |
| 4 | 2 | EA | Remove and replace Exhaust fan EF 1 including duct work | | $ | $ |
| 5 | 1 | EA | Remove and replace Digital Temperature Control including bacnet control | | $ | $ |
| 6 | 2 | EA | Split system schedule AHU 1/2 including removing and replacing of connection lines | | $ | $ |
| 7 | 1 | EA | Split system heat pump AHU 3 including removing and replacing of connection lines | | $ | $ |
| 8 | 2 | EA | Split system heat pump AHU 4/5 including removing and replacing of connection lines | | $ | $ |
| 9 | 2 | EA | Condensing Unit CU 1/2 including removing and replacing of connection lines | | $ | $ |
| 10 | 2 | EA | Condensing Unit CU 4/5 including removing and replacing of connection lines | | $ | $ |
| 11 | 1 | EA | Condensing Unit CU 3 including removing and replacing of connection lines | | $ | $ |
| 12 | 1 | EA | DDC CONTROLLER | | $ | $ |
| 13 | 1 | EA | Web based front end energy management system | | $ | $ |
| 14 | 1 | LS | Rigid fiberglass ductboard with antimicrobial coating and 1.5" R-6 insulation | | $ | $ |
| 15 | 1 | LS | Duct smoke detector | | $ | $ |
| 16 | 1 | LS | Fire dampers at penetrations through rated walls | | $ | $ |
| 17 | 6 | EA | Temporary room/space AC units | | $ | $ |
| | | | | | ***PROJECT TOTAL*** | $ |

# City of Sanibel
## Required Bid Items

### City Hall Finance & IT Wing HVAC Replacement Project

### December 4, 2025

| No. | Name | Page Reference |
|---|---|---|
| 1 | Bid Package in sealed envelope marked with Title of Bid, Bid Number, Name & Address of Bidder | Cover page<br>Invitation to Bid |
| 2 | Complete proposal on form provided | Sheet A-1<br>Sheets P1 & P2 |
| 3 | Complete Unit Price Proposal | Sheet P-3 |
| 4 | Include Certified Check or Bid Bond 5% or more of total bid price | Sheet A-1 and<br>IB-3 |
| 5 | Acknowledge issued addenda on page 2 of Proposal Form | Sheet IB-2, P2, GC-1 |
| 6 | Letter or statement from Bidder's surety company it will execute and deliver a 100% Performance and Payment Bond | Sheet IB-2 |
| 7 | Furnish evidence they have ability & experience, have sufficient capital and plant, and minimum FIVE (5) years of experience | Sheet IB-4 |

# SPECIMEN FORM OF CONTRACT

THIS CONTRACT, made this _____ day of _____, 2026, by and between THE CITY OF SANIBEL, FLORIDA, hereinafter called "OWNER", and _____ a Florida profit corporation, hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the covenants set forth below and other good and valuable consideration, the sufficiency and receipt of which is acknowledged, OWNER and CONTRACTOR hereby agree as follows:

1. The term "CONTRACT DOCUMENTS" means and includes the following, all of which are incorporated herein and made part of the CONTRACT:

   A. Specifications for “City Hall Finance & IT Wing HVAC Replacement Project” dated November 3, 2025, including, without limitation, all General Specifications, General Conditions, Special Provision, Required Contract Provisions, Technical Specifications, Drawings and Appendices
   B. Bidding Documents, including Advertisement, Information to Bidders, and Addenda
   C. CONTRACTOR’S Proposal in response to ITB-PW-2-2026/SK
   D. This CONTRACT
   E. Performance and Payment Bond
   F. Notice of Award
   G. Notice to Proceed
   H. Change Order(s)

2. The CONTRACTOR will commence and complete the construction which includes:

   **“City Hall Finance & IT Wing HVAC Replacement Project” as described in the CONTRACT DOCUMENTS (the “WORK”)**

3. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the completion of the WORK.

4. The CONTRACTOR will commence the WORK within 6 calendar days after date of the NOTICE TO PROCEED and will complete the same no later than **FORTY-FIVE (45)** calendar days of the NOTICE TO PROCEED, unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

5. The CONTRACTOR agrees to perform all of the WORK in accordance with the CONTRACT DOCUMENTS for the sum of **$_____** said amount being the total “**unit price sum / lump sum price”** as listed on the Contractor's proposal form as submitted for this project.

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. The CONTRACT DOCUMENTS embody the entire agreement of CONTRACTOR and OWNER regarding the Work. No deviation from the CONTRACT DOCUMENTS will be allowed, honored or compensated unless accompanied by a fully executed change order.

8. This CONTRACT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns; however, CONTRACTOR shall not assign or otherwise

transfer its rights, duties or obligations under this CONTRACT without prior written consent of OWNER.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in counterparts each of which shall be deemed an original on the date first above written.

(SEAL)

ATTEST_____

Name_____

Title_____

OWNER City of Sanibel

By_____

Name_____

Title_____

(SEAL)

ATTEST_____

Name_____

Title_____

CONTRACTOR: _____

By_____

Name_____

Title _____

Email _____

Approved as to form

_____
City Attorney

**SPECIMEN FORM OF CONTRACT**
**PERFORMANCE AND PAYMENT BOND**

BY THIS BOND, WE

_____
(Name of Contractor)

_____
(Address of Contractor)

A _____, as principal, and
(Corporation, Partnership, or Individual)

_____
(Name of Surety)

_____
(Address of Surety)

a Corporation, as Surety, are bound to

_____
(Name of Owner)

_____
(Address of Owner)

herein called Owner, in the sum of _____

_____Dollars, ($_____)

for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the Contract dated _____, **"Year"** between Principal and Owner for construction of:

   _____

   _____

   _____

   _____

   the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract and;

2. Promptly makes payments to call claimants, as defined in Section 255.05 (1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract and;

3. Pays Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the Contract and;

4. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract; then this bond is void; otherwise it remains in full force.

Any changes in or under the Contract Documents and compliance or non-compliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this bond.

DATED ON _____, **"Year"**.

ATTEST:

_____
Principal

_____
(Principal) Secretary

By_____

_____

_____

_____

(SEAL)

_____
(Witness as to Principal)

_____
(Address)

_____

ATTEST:

_____
Surety

_____ By_____
(Surety) Secretary Attorney-in-Fact

(SEAL)

_____
(Address)

_____ _____
(Witness as to Surety)

_____ _____
(Address)

_____

NOTE: Date of bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

## PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT: _____ OWNER: _____

ENGINEER: _____ CONTRACTOR: _____

PERIODIC ESTIMATE NO. _____ FOR PERIOD _____ TO _____

## ANALYSIS OF ADJUSTED CONTRACT AMOUNT TO DATE

A. Original contract amount (Col.6) _____
B. Plus: Change Order Additions (Col.13) _____
C. Less: Change Order Deductions (Col.16) _____
D. Adjust contract amount to date _____

### ANALYSIS OF WORK PERFORMED

1. Amount of original contract work performed to date (Col.8) _____
2. Change Order work performed to date _____
3. Total amount of work performed to date _____
4. Add: Materials stored at close of this period
   (Attach detailed schedule _____
5. Less: Amount retained _____ percent _____
6. Net amount earned on contract work to date _____
7. Less: Amount of previous payments_____
8. Balance due this payment_____

## CERTIFICATION OF CONTRACTOR

According to the best of my knowledge and belief, I certify that all items and amounts shown on the face of this periodic estimate are correct; that all work has been performed and/or material supplied in full accordance with the Terms and Conditions of the Contract, and/or duly authorized deviations, substitutions, alterations, and/or additions; that this estimate is as true and correct statement of the contract account up to and including the last day of the period covered by this Periodic Estimate, and that no part of the "Balance Due This Payment" has been received:

_____ By_____
(Contractor) (Authorized Representative)

_____ Title_____

## RECOMMENDATION OF ENGINEER

In accordance with the contract and this Periodic Estimate for Partial Payment, the Contractor is entitled to payment in the amount shown above.

DATE: _____ By_____

# PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT:

OWNER:

ENGINEER:

CONTRACTOR:

PERIODIC ESTIMATE NO. _____ FOR PERIOD _____TO_____

| | | CONTRACT AMOUNT | | | | COMPLETED TO DATE | | |
|---|---|---|---|---|---|---|---|---|
| ITEM NO. (1) | DESCRIPTION OF ITEM (2) | QUANTITY (3) | UNIT OF MEAS. (4) | COST PER UNIT (5) | TOTAL AMOUNT (6) | QUANTITY (7) | AMOUNT (8) | % COM-PLETE (9) |
| TOTAL | | | | | | | | |

## PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT:

OWNER:

ENGINEER:

CONTRACTOR:

PERIODIC ESTIMATE NO. _____FOR PERIOD _____ TO _____

SCHEDULE OF CHANGE ORDERS

| CHANGE ORDER | | | | ADDITIONS | | |
|---|---|---|---|---|---|---|
| NO. (10) | DATE (11) | DESCRIPTION (12) | AMOUNT (13) | PERCENT COMPLETE (14) | AMOUNT COMPLETED TO DATE (15) | DEDUCTIONS (16) |
| TOTAL | | | | | | |

**CONTRACTOR'S LETTERHEAD**

# CONTRACTOR'S CERTIFICATE

I, _____, the duly qualified, acting and authorized agent of the Contractor, _____ on the project, do hereby certify that we have performed all of the work set forth in strict accordance with the plans, specifications, laws and ordinances applicable thereto and do further certify that all materials and equipment listed herein have been paid for in full as allowed on all prior Estimates and, if requested to do so, will show evidence of payment for same in writing before the final payment of this Estimate No. _____.

I further certify (if this is a Final Estimate) that the amount received hereunder is considered compensation and final payment in full for all work performed under the Contract, including any amendments thereto, and upon payment of said sum, hereby release the Owner, its employees, agents, and representatives in accordance with said Contract. We further certify that we fully guarantee all work performed hereunder for a period of twelve months from the date of payment for the Final Estimate, (in accordance with the terms of our original Contract and all Amendments thereto), during which time all terms and conditions of the original Contract Documents shall remain in full force and effect, including the insurance requirements, Hold Harmless Agreement and Indemnifying Agreements as contained in said Contract Documents.

CERTIFIED TO FOR PAYMENT ON THIS _____ DAY OF _____, **"Year"**.

CONTRACTOR'S SEAL

_____
Contractor

BY: _____

TITLE: _____

Sworn to before me this _____ day of _____, **"Year"**.

_____
NOTARY

My commission expires: _____:

(NOTARY SEAL)

PROJECT: _____

OWNER: City of Sanibel _____

CHANGE ORDER NO. _____

TO: _____

_____

_____

You are hereby authorized to make the following additions and/or deductions to your contract amount.

| | PREVIOUS CONTRACT AMOUNT | NET CHANGE | | REVISED | | CONTRACT AMOUNT |
|---|---|---|---|---|---|---|
| | | INCREASE | DECREASE | (DEDUCT) | (ADD) | |
| TOTAL: | $_____ | $_____ | $_____ | $_____ | $_____ | $_____ |

Description of Change: Add Deduct

RECOMMENDED: APPROVED:

OWNER_____
By_____ By _____
Title_____ Date_____ Title_____ Date_____

ACCEPTED:

CONTRACTOR_____
BY _____
Title _____ Date _____

# GENERAL CONDITIONS OF THE CONTRACT

## SECTION 2.1 - CONTRACT DOCUMENTS

### 2.1.01 GENERAL:

The Contract Documents comprise the following general classifications of documents, including all additions, deletions, modifications, or other documents incorporated therein:

1. Bidding Documents
2. Contract
3. General Conditions of the Contract
4. Special Conditions
5. Specifications

### 2.1.02 BIDDING DOCUMENTS:

The Bidding Documents are issued by the OWNER to assist bidders in preparing their proposal include:

1. Advertisement
2. Information for Bidders
3. Proposal: The offer of a Bidder to perform the work described by the Contract Documents made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.
4. Addenda to Contract Documents: Any addenda issued during the time of bidding, or forming a part of the Contract Documents loaned to the Bidder for the preparation of his Proposal, shall be covered in the Proposal, and shall be made a part of the Contract. Receipt of each Addendum shall be acknowledged in the Proposal.

### 2.1.03 CONTRACT:

The Contract defines the “Contract Documents” and covers the performance of the work described in the Contract Documents including all supplemental addenda thereto and all general and special provisions pertaining to the work or materials.

### 2.1.04 GENERAL CONDITIONS OF THE CONTRACT:

The General Conditions of the Contract outline certain general responsibilities of the OWNER and the CONTRACTOR (who are the parties to the Contract) and those responsibilities delegated by the OWNER to the Engineer who acts as the agent of the OWNER.

1. Definitions: Wherever the words hereinafter defined, or pronouns used in their stead, occur in these specifications and contract documents, they shall have the meanings herein given:

   A. The word "OWNER" shall mean the municipality, person, firm, or corporation as specified in the Advertisement for Bids, for whom the work is to be done.

B. The word "CONTRACTOR" shall mean the person, firm, or corporation entering into a contract with the OWNER to construct and complete the work as herein specified, set out and shown.

C. The word "sub-contractor" shall mean a person, firm, or corporation, other than a CONTRACTOR, supplying labor and materials or labor for work at the site of the project.

D. The word "Engineer" shall mean the project engineer as designated by the OWNER.

## 2.1.05 SPECIAL CONDITIONS:

Special Conditions are special provisions not included in the General Conditions of the Contract, which apply to this specific project.

## 2.1.06 DRAWINGS AND SPECIFICATIONS:

The intent of the Drawings and Specifications is that the CONTRACTOR shall furnish all labor, materials, equipment, and transportation necessary for the proper execution of the work, unless specifically noted otherwise. The CONTRACTOR shall do all the work outlined in the Contract Documents and all incidental work necessary to complete the project in a substantial and acceptable manner, and fully complete the work or improvement, operational and ready for occupancy by the OWNER.

1. Discrepancies: Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings and Specifications shall be immediately reported to the Engineer, who shall promptly correct such inconsistencies or ambiguities in writing. Any work done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the CONTRACTOR'S risk.

2. Adequacy: Responsibility for adequacy of the design and for sufficiency of the Drawings and Specifications shall be borne by the OWNER. The complete requirements of the work to be performed under the Contract shall be set forth in Drawings and Specifications to be supplied by the OWNER through the Engineer or by the Engineer as representative of the OWNER. The Drawings and Specifications shall be considered inseparable documents; and in considering them, the CONTRACTOR shall rely upon both instruments in order to perform the work in accordance with their combined intent.

3. Additional Instructions: Further instructions may be issued by the Engineer during the progress of the work by means of Drawings, or otherwise to make more clear or specific the Drawings and Specifications or as may be necessary to explain or illustrate changes in the work to be done. Where said correction of errors or omissions, except as provided in the next two paragraphs below, adds to the amount of work to be done by the CONTRACTOR, compensation for said additional work shall be made under the item for Extra Work except where the additional work may be classed under some item of work for which a unit price is included in the proposal.

4. The fact that specific mention of the fixture, or of any part of work, is omitted in the specifications, whether intentionally or otherwise, when the same is clearly shown or indicated on the drawings, or is usually and customarily required to fully complete such work as is specified herein, will not entitle the CONTRACTOR to consideration in the matter

of any claim for extra compensation, but the said fixtures or work or both must be installed or done the same as if called for by both drawings and specifications.

5. All work indicated on the drawings and not mentioned in the specifications or vice versa, and all work and material usual and necessary to make work complete in all its parts, whether or not they are indicated on the drawings or mentioned in the specifications, shall be furnished and executed the same as if they were called for by both the drawings and specifications.

6. Plans and Specifications: The Engineer may furnish the CONTRACTOR up to 5 sets of plans and specifications covering this project at no cost to the CONTRACTOR. For each set of plans and specifications furnished to the CONTRACTOR, or any of his sub-contractor's, in excess of this number, the CONTRACTOR shall be billed at actual cost of printing and delivery.

7. Dimensions: Only figured dimensions on the Drawings will be used by the CONTRACTOR. Where the work of the CONTRACTOR is affected by finish dimensions, these shall be determined by the CONTRACTOR at the site, and he shall assume the responsibility, therefore.

## 2.1.07 CONTRACT DOCUMENTS FOR THE USE OF THE ENGINEER:

The CONTRACTOR shall maintain one complete set of the Contract Documents at the job site which shall always be available to the Engineer and upon which the CONTRACTOR shall record all changes and field adjustments. The CONTRACTOR shall keep one copy of plans, shop drawings, and supplemental drawings at the site in good order and annotated to show all changes made during construction. An as-built survey of the project shall be performed and submitted to OWNER prior to final acceptance. The survey shall be conducted in accordance with the standards set forth in Chapter 472 of the Florida Statutes and the Minimum Technical Standards for such survey as specified in Chapter 61G17 of the Florida Administrative Code. The cost of the survey shall be borne by the CONTRACTOR.

# SECTION 2.2 - OWNER-CONTRACTOR-ENGINEER RELATIONS

## 2.2.01 OWNER'S RIGHTS AND RESPONSIBILITIES:

1. Lands by OWNER: The OWNER will provide the lands shown on the Drawings or described in the Specifications upon which the work under the Contract is to be performed and to be used for right-of-way for access. Any delay in furnishing these lands by the OWNER will be deemed proper for adjustment in the Contract Amount and in the time of completion.

2. Base Lines and Bench Marks: Unless otherwise specified, the OWNER will establish base lines, and bench marks.

3. OWNER'S Right to Correct Deficiencies: Upon failure to perform the work in accordance with the Contract Documents, including any requirements with respect to the Schedule of Completion, and after five days' written notice to the CONTRACTOR, the OWNER may, without prejudice to any other remedy he may have, correct such deficiencies in work intended to become a permanent part of the project. The cost to correct such deficiencies may be deducted from the payment due the CONTRACTOR.

4. Suspension of Work by OWNER: The OWNER shall have the authority to suspend the work, wholly or in part, for such period or periods as he may deem necessary due to unsuitable weather or such other conditions as are considered unfavorable to carry out the provisions of the Contract, or to supply materials meeting the requirements of the Contract Documents.

   A. Notice: The work or any portion thereof may be suspended at any time by the OWNER provided that he gives the CONTRACTOR five days' notice of suspension which shall set forth the date on which work is to be resumed. The CONTRACTOR shall resume the work upon written notice from the OWNER and within ten days after the date set forth in the notice of suspension. If the OWNER does not give written notice to resume work within ten days of the date fixed in the notice of suspension, the CONTRACTOR may abandon that portion of the work so suspended and shall be entitled to payment in accordance with Paragraph 2.6.09, Payment for Work Suspended by the OWNER.

   B. In case of any suspensions, the time in which the CONTRACTOR is required to complete the work shall be extended as many working days as the same is suspended; provided, however, that if the work is suspended on account of failure on the part of the CONTRACTOR to comply with specifications, such extensions of time will not be allowed.

5. OWNER'S Right to Terminate Agreement and Complete the Work: The OWNER shall have the right to terminate his agreement with the CONTRACTOR after giving ten days' written notice of termination to the CONTRACTOR in the event of any default by the CONTRACTOR.

   A. Default by CONTRACTOR: It shall be considered a default by the CONTRACTOR whenever he shall:

      (i) Declare bankruptcy, become insolvent, or assign his assets for the benefit of his creditors.

      (ii) Disregard or violate provisions of the Contract Documents or fail to prosecute the work according to the agreed Schedule of Completion, including extensions thereof.

      (iii) Fail to provide a qualified superintendent, competent workmen or sub-contractor’s, or proper materials, or fail to make prompt payment, therefore.

   B. Completion by the OWNER: In the event of termination of the Agreement by the OWNER because of default by the CONTRACTOR, the OWNER may take possession of the work and of all materials and equipment thereon and may finish the work by whatever method and means he may select.

## 2.2.02 CONTRACTOR'S RIGHTS AND RESPONSIBILITIES:

All work shall be done in strict accordance with the Contract Documents. Observations, construction reviews, tests, recommendations or approvals by the Engineer or persons other than the CONTRACTOR, shall in no way relieve the CONTRACTOR of his obligation to complete all work in accordance with the Contract Documents. All work shall be done under the direct supervision of the

CONTRACTOR. The CONTRACTOR shall be responsible for construction means, methods, techniques and procedures, and for providing a safe place for the performance of the work by the CONTRACTOR, Sub-contractor's, suppliers and their employees, and for access use, work or occupancy by all authorized persons. The CONTRACTOR shall be responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction".

1. Lands by CONTRACTOR: Any land and access thereto not specifically shown to be furnished by the OWNER that may be required for temporary construction facilities or for storage of materials shall be provided by the CONTRACTOR with no liability to the OWNER. The CONTRACTOR shall confine his apparatus and storage to such additional areas as he may provide at his expense.

   A. Private and Public Property: The CONTRACTOR shall not enter upon private property for any purpose without obtaining permission; and he shall be responsible for the preservation of all public property, trees, monuments, structures, and improvements, along and adjacent to the street and/or right-of-way and shall use every precaution necessary to prevent damage or injury thereto. He shall use suitable precautions to prevent damage to pipes, conduits, and other underground structures, and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

2. Surveys: Based upon the information provided by the OWNER, the CONTRACTOR shall develop and make all detailed surveys necessary for construction, including slope stakes, batter boards, stakes for pile locations and other working point lines, and elevations. The CONTRACTOR shall carefully preserve bench marks, reference points and stakes; and, in the case of destruction thereof by the CONTRACTOR or resulting from his negligence, the CONTRACTOR shall be charged with the expense and damage resulting there from and shall be responsible for any mistakes that may be caused by the loss or disturbance of such bench marks, reference points, and stakes.

3. Public Utilities: The elevation and location of all public utilities shown on the Drawings were taken from existing public records. It shall be the duty of the CONTRACTOR to make final and exact determination of the location and extent of all utilities, and he will be liable for any expense resulting from damage to them.

4. Superintendent: A qualified superintendent, who is acceptable to the OWNER, shall be maintained on the work and give efficient supervision to the work until its completion. The superintendent shall have full authority to act in behalf of the CONTRACTOR, and all instruction given to the superintendent shall be considered as given to the CONTRACTOR. It shall be the responsibility of this CONTRACTOR's superintendent to coordinate the work of all the sub-contractor's. The superintendent shall be present on the site at all times required to perform adequate supervision and coordination.

5. Subcontracts: At the time set forth in the Contract Documents or when requested by the OWNER, the CONTRACTOR shall submit in writing for review of the OWNER the names of the sub-contractor's proposed for the work. Sub-contractor's may not be changed, except at the request or with the approval of the OWNER. The CONTRACTOR is responsible to the OWNER for the acts and deficiencies of his sub-contractor's, and of their direct and indirect employees, to the same extent as he is responsible for the acts and deficiencies of his employees. The Contract Documents shall not be construed as creating

any contractual relation between any sub-contractor and the OWNER. The CONTRACTOR shall bind every sub-contractor by the terms of the Contract Documents.

A. For convenience of reference and to facilitate the letting of Contracts and Subcontracts, the Specifications are separated into titled sections. Such separation shall not, however, operate to make the OWNER or the Engineer an arbiter to establish limits to the contracts between CONTRACTOR and sub-contractor.

6. CONTRACTOR'S Right to Suspend Work or Terminate Agreement: CONTRACTOR may suspend work or terminate his Agreement with the OWNER upon ten days' written notice to the OWNER for any of the following reasons:

A. If an order of any court or other public authority caused the work to be stopped or suspended for a period of 90 days through no act or fault of the CONTRACTOR or his employees.

B. If the OWNER should fail to pay the CONTRACTOR any sum within 45 days after its award by arbitrators.

7. Work During an Emergency: The CONTRACTOR shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases, he shall notify the OWNER of the emergency as soon as practicable, but he shall not wait for instruction before proceeding to properly protect both life and property.

## 2.2.03 RESPONSIBILITY OF THE ENGINEER:

The Engineer shall decide questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of Drawings and Specifications, and all questions as to the acceptable fulfillment of the Agreement on the part of the CONTRACTOR. The duties and responsibilities of the Engineer as set forth herein shall not be extended, except through written consent of the Engineer and the OWNER.

1. Observation of the Work: All materials and each part or detail of the work shall always be subject to observation by the Engineer and the OWNER; and the CONTRACTOR will be held strictly to the intent of the Contract Documents in regard to quality of materials, workmanship, and the diligent execution of the Contract. Observations may be made at the site or at the source of material supply, whether mill, plant, or shop. The Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the CONTRACTOR as is required to make his observations and construction review.

2. Acceptability of Work: The Engineer's decision as to the acceptability or adequacy of the work shall be final and binding upon the CONTRACTOR. The CONTRACTOR agrees to abide by the Engineer's decision relative to the performance of the work.

3. Engineer's Decisions: All claims of the OWNER or the CONTRACTOR shall be presented to the Engineer for decision which shall be final, except in cases where time and/or financial considerations are involved, which shall be subject to arbitration.

## 2.2.04 ORAL AGREEMENTS:

No oral order, objection, claim, or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents; and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than a definitely agreed waiver or modification thereof in writing; and no evidence shall be introduced in any proceeding of any other waiver or modification.

## 2.2.05 OBSERVATION OF COMPLETED WORK

The CONTRACTOR shall remove or uncover such portions of the completed work as may be directed by the OWNER at any time before acceptance of the work. After examination, the CONTRACTOR shall restore the work to the standard required by the Contract Documents. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the restoring of the work shall be paid for as Extra Work; but should the work exposed or examined prove unacceptable, the uncovering, removing, and restoring of the work shall be at the CONTRACTOR'S expense.

## 2.2.06 WORK BY OWNER OR OTHER CONTRACTOR'S:

1. Separate Contracts: The OWNER may let other contracts in connection with the work of the CONTRACTOR. The CONTRACTOR shall cooperate with other CONTRACTOR'S regarding storage of materials and execution of their work. It shall be the CONTRACTOR'S responsibility to inspect all work by other CONTRACTOR'S affecting his work and to report to the OWNER any irregularities which will not permit him to complete his work in a satisfactory manner. His failure to notify the OWNER of such irregularities shall indicate the work of other CONTRACTOR'S has been satisfactorily completed to receive his work. The CONTRACTOR shall not be responsible for defects of which he could not have known, which develop in the work of others after the work is completed. It shall be the responsibility of the CONTRACTOR to measure the completed work in place and report to the OWNER immediately any difference between completed work by others and the provisions of the Contract Documents.

2. Written Agreement: Whenever work being done by the OWNER through his own employees or through other CONTRACTOR'S is contiguous to work covered by the Contract Documents, the respective rights of the various interests involved shall be established by written agreement to secure the completion of the various portions of the work in general harmony.

## 2.2.07 SECTION DELETED

## 2.2.08 NIGHT AND SUNDAY WORK:

No night or Sunday work requiring the presence of an Engineer or Inspector will be permitted, except in case of emergency and then only to such an extent as it is absolutely necessary and with written approval of the Engineer, provided that the clause shall not operate in case of a gang organized for regular and continuous night work, and on work which, in the opinion of the Engineer, can be performed satisfactorily at night or on Sunday.

## SECTION 2.3 - MATERIALS, EQUIPMENT, AND WORKMANSHIP

### 2.3.01 MATERIALS AND EQUIPMENT:

The materials and equipment installed in the work shall meet the requirements of the Contract Documents, and no materials or equipment shall be ordered until reviewed by the Engineer. All materials and equipment not otherwise specifically indicated shall be furnished by the CONTRACTOR. The CONTRACTOR shall guarantee all materials and equipment he provides in accordance with Paragraph 2.3.08.

1. Substitutions: In order to establish standards of quality, the Engineer has, in the detailed Specifications, referred to certain products by name and catalog number. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design.

   A. The CONTRACTOR shall furnish the complete list of proposed desired substitutions prior to signing of the Contract, together with such engineering and catalog data as the Engineer may require.

   B. The CONTRACTOR shall abide by the Engineer's recommendation when proposed substitute materials or items of equipment are not recommended for installation and shall furnish the specified material or item of equipment in such case. All proposals for substitutions shall be submitted in writing by the General CONTRACTOR and not by individual trades or material suppliers. The Engineer will review proposed substitutions and make his recommendations in writing within a reasonable time.

2. Space Requirements: It shall be the responsibility of the CONTRACTOR to ensure that materials and equipment to be furnished fit the space available. He shall make necessary field measurements to ascertain space requirements, including those for connections and shall order such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the Contract Documents.

3. Arrangement: Where equipment requiring different arrangement of connections from those shown is approved, it shall be the responsibility of the CONTRACTOR to install the equipment to operate properly, and in harmony with the intent of the Contract Documents, and to make all changes in the work required by such arrangement.

4. Unacceptable Materials and Equipment: Materials and equipment which do not conform to the requirements of the Contract Documents, are not equal to samples reviewed by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, shall not be furnished nor installed.

5. Storage: Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and/or they shall be placed under cover. Stored materials and equipment shall be located to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the OWNER or lessee.

6. Manufacturer's Directions: Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

## 2.3.02 SAMPLES:

All samples called for in the Specifications or required by the Engineer shall be furnished by the CONTRACTOR and shall be submitted to the Engineer for his review. Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for the consideration of the samples submitted.

1. Samples for Tests: CONTRACTOR shall furnish such samples of material as may be required for examination and test. All samples of materials for tests shall be taken according to standard methods or as provided in the Contract Documents.

2. CONTRACTOR'S Guaranty: All samples shall be submitted by the CONTRACTOR with a covering letter indicating that such samples are recommended by the CONTRACTOR for the service intended and that the CONTRACTOR'S Guaranty will fully apply.

3. All materials, equipment, and workmanship shall be in accordance with samples guaranteed by the CONTRACTOR and reviewed by the Engineer.

## 2.3.03 SHOP DRAWINGS:

The CONTRACTOR shall provide shop drawings, setting schedules and such other drawings as may be necessary for the prosecution of the work in the shop and in the field as required by the Drawings, Specifications, or the Engineer's instructions. Deviations from the Drawings and Specifications shall be called to the attention of the Engineer at the time of the first submission of shop drawings and other drawings for consideration. The Engineer's review of any drawings shall not release the CONTRACTOR from responsibility for such deviations. Shop drawings shall be submitted according to a schedule prepared jointly by the CONTRACTOR and the Engineer.

1. CONTRACTOR'S Certification: When submitted for the Engineer's review, shop drawings shall bear the CONTRACTOR'S certification that he has reviewed, checked, and approved the shop drawings; that they are in harmony with the requirements of the Project and with the provisions of the Contract Documents; and that he has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. CONTRACTOR shall also certify that the work represented by the shop drawings is recommended by the CONTRACTOR and the CONTRACTOR'S Guaranty will fully apply.

## 2.3.04 EQUIPMENT DATA:

The CONTRACTOR shall submit for the Engineer’s review complete catalog data for every manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, material gage or thickness, brand name, catalog number, and general type. This submission shall be compiled by the CONTRACTOR and reviewed by the Engineer before any of the equipment is ordered.

1. Index: Each data sheet or catalog in the submission shall be indexed according to specification section and paragraph for each reference.

2. Relation to Contract Documents: Catalog data for equipment reviewed by the Engineer shall not supersede the Engineer's Contract Documents. The review of the Engineer shall not relieve the CONTRACTOR from responsibility for deviations from Drawings or Specifications, unless he has in writing called the Engineer's attention to such deviations at the time of submission, nor shall it relieve him from responsibility for error of any sort in the items submitted. The CONTRACTOR shall check the work described by the catalog data with the Engineer's Contract Documents for deviations and errors.

3. CONTRACTOR'S Certification: Equipment data shall be submitted by the CONTRACTOR with a covering letter indicating that he has reviewed, checked and approved the data submitted; that they are in harmony with the requirements of the project and with the provisions of the Contract Documents; and that he has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. CONTRACTOR shall also certify that the work represented by the shop drawings is recommended by the CONTRACTOR and that his Guaranty will fully apply.

## 2.3.05 REJECTED WORK AND MATERIALS:

Any defective work whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause shall be removed within ten days after written notice is given by the OWNER, and the work shall be re-executed by the CONTRACTOR. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of it.

1. Should the CONTRACTOR fail to remove rejected work or materials within ten days after written notice to do so, the OWNER may remove them and may store the materials.

2. Correction of faulty work after final payment shall be in accordance with Paragraph 2.5.12.

## 2.3.06 CUTTING AND PATCHING:

The CONTRACTOR shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the Drawings and Specifications to complete the structure. He shall restore all such cut or patched work as approved by the Engineer. Cutting of existing structure that may endanger the work, adjacent property, workmen, or the public shall not be done.

## 2.3.07 CHARACTER OF WORKMEN:

The CONTRACTOR shall always be responsible for the conduct and discipline of his employees and/or any sub-contractor or persons employed by sub-contractor's. All workmen must have sufficient knowledge, skill, and experience to perform properly the work assigned to them. Any foreman or workman employed by the CONTRACTOR or sub-contractor who does not perform his work in a skillful manner or appears to be incompetent or to act in a disorderly or intemperate manner shall, at the written request of the OWNER, be discharged immediately and shall not be employed again in any portion of the work without the approval of the OWNER.

## 2.3.08 GUARANTY:

The CONTRACTOR shall guarantee all materials and equipment furnished and work performed for a period of one year from the date of written acceptance of the work.

1. Correction of faulty work after final payment shall be as provided in Paragraph 2.5.12.

## 2.3.09 A.S.T.M. DESIGNATION:

Wherever the letters “A.S.T.M.” are used in these specifications, it shall be understood as referring to the American Society for Testing Materials. When reference is made to a certain Designation Number of a specification or test as set out or given by the American Society of Testing Materials, it shall be understood to mean the current, up-to-date standard specification or tentative specification for that particular process, material, or test as currently published by that group.

# SECTION 2.4 – INSURANCE, LEGAL RESPONSIBILITY, AND SAFETY

## 2.4.01 INSURANCE:

CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as well as provide protection from claims set forth below which may arise out of or result from CONTRACTOR'S performance of the Work and CONTRACTOR'S other obligations under the Contract Documents, whether such performance is by CONTRACTOR, by any sub-contractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. All insurance policies shall be with insurers qualified to do business in the state of the Project location.

1. Types: The types of insurance the CONTRACTOR is required to obtain and maintain for the full period of the Contract will be: Workmen's Compensation and Employer's Liability, Comprehensive General Liability and Automobile Liability, U.S.L.& H. coverage (if applicable), Jones Act (if applicable) and an Excess Liability Umbrella Insurance as detailed in the following specifications.

2. Evidence: As evidence of specified insurance coverage, the OWNER may, in lieu of actual policies, accept a Certificate of Insurance on Accord Form 25 issued by the insurance carrier showing such policies in force for the specified period. Each policy or certificate will bear an endorsement or statement waiving right of cancellation or reduction in coverage without ten days notice in writing to be delivered by registered mail to the OWNER. Should any policy be canceled before final payment by the OWNER to the CONTRACTOR and the CONTRACTOR fails immediately to procure other insurance as specified, the OWNER reserves the right to procure such insurance and to deduct the cost thereof from any sum due the CONTRACTOR under this Contract.

3. Adequacy of Performance: Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guaranty period. Should such insurance be canceled before the end of the guaranty period and the CONTRACTOR fails immediately to procure other insurance as specified, the OWNER reserves the right to procure such insurance and to charge the cost thereof to the CONTRACTOR.

4. Payment of Damages: Nothing contained in these insurance requirements is to be construed as limiting the extent of the CONTRACTOR'S responsibility for payment of damages resulting from his operations under this Contract.

## 2.4.02 COMPREHENSIVE GENERAL LIABILITY INSURANCE:

1. General liability insurance shall provide full comprehensive form coverage for both bodily injury and property damage. Such coverage shall include premises-operations, underground hazard, products/completed operations hazard, contractual insurance, broad

form property damage, independent CONTRACTOR'S, and personal injury. The limits for bodily injury shall be $500,000 each occurrence and $500,000 aggregate. The limits for property damage shall be $100,000 each occurrence and $100,000 aggregate.

2. Automobile liability insurance shall provide full comprehensive form coverage for both bodily injury and property damage. Such coverage shall include owned, hired, and non-owned vehicles. The limits for bodily injury shall be $500,000 each person and $500,000 each accident. The limits for property damage shall be $100,000.

3. Excess liability insurance shall provide an umbrella form coverage for both bodily injury and property damage combined with a minimum limit of $2,000,000.

4. Indemnity: Included in such insurance will be contractual coverage sufficiently broad to insure the OWNER, the Engineer, their consultants and each of their officers, agents, and employees as additional insured under the General Liability Policy. See Paragraph 2.4.05 below for provisions of Indemnity.

**2.4.03 WORKMEN'S COMPENSATION INSURANCE:**

CONTRACTOR'S shall provide the statutory Workmen's Compensation and Employer's Liability Insurance requirements of the most current and applicable state Workmen's Compensation Insurance Laws.

**2.4.04 DELETED**

**2.4.05 INDEMNITY:**

The CONTRACTOR (sub-contractor) hereinafter "Indemnitor", hereby agrees to indemnify, save and hold harmless, and defend at its own expense the Engineer, OWNER, their respective partners, agents, employees, and anyone else acting for or on behalf of any of them, and any other person or entity for whom any of them may be legally responsible (herein collectively called "Indemnities") from all claims, losses, damages, suits, costs and expenses, including attorneys' fees, or actions of any nature whatsoever which arise out of or are connected with, or are alleged to arise out of or be connected with, the Work to be performed herein; including without limiting the generality of the foregoing, all liability for damages, loss, claims, demands, and actions arising or alleged to arise from injury including death, damage to property including the loss of use thereof and consequential damages therefrom, or damages arising out of economic loss, to any person or entity including any Indemnitee or Indemnitor or its employees, servants and agents whether based upon, or claimed to be based upon, statutory (including without limiting the generality of the foregoing, workmen's compensation), contractual, tort or other liability of any Indemnitee whether or not caused, or alleged to be caused, in whole or in part, by the joint, several or sole negligence, breach of contract, breach of warranty, strict liability, or other breach of duty by any Indemnitee, its partners, employees, agents, and anyone else for or on behalf of any of them, or any other person for whom any Indemnitee may be responsible.

In the event more than one Indemnitor is responsible or alleged to be responsible in respect to an accident or occurrence covered by this indemnification, then all of such Indemnitor shall be jointly and severally responsible to the Indemnities for indemnification shall be settled by separate proceedings and without jeopardy to any Indemnitee.

The indemnity provided hereunder shall not include indemnification of the Engineer in respect to claims arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or (2) the giving of or the failure to give directions or instructions by

the Engineer, his agents or employees; provided that such giving or failure to give is a primary cause of the injuries and damages.

If any part of these indemnity provisions is adjudged to be contrary to law, the remaining parts of these provisions shall in all other respects be and remain legally effective and binding. Moreover, these indemnity provisions shall not be construed to eliminate or in any way reduce any other indemnification or right which the Engineer and OWNER has by law.

**2.4.06 WAIVER OF SUBROGATION:**

The OWNER and the CONTRACTOR waive all rights against (1) each other and other sub-contractor's, agents, and employees of each other, and (2) the Engineer and separate CONTRACTOR'S, if any, and their sub-contractor's, agents, and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Section 2.4 or any other property insurance applicable to the work, except such rights as they may have to the proceeds of
such insurance held by the OWNER as trustees. The OWNER or the CONTRACTOR, as appropriate, shall require of the Engineer, separate CONTRACTOR'S and sub-contractor's by appropriate agreements, written where legally required for validity, similar waivers each in favor of all other parties enumerated in this subparagraph 2.4.06.

**2.4.07 PATENTS AND ROYALTIES:**

If any design, device, material, or process covered by letters, patent or copyright is used by the CONTRACTOR, he shall provide for such use by legal agreement with the OWNER of the patent or a duly authorized licensee of such OWNER, and shall save harmless the OWNER and the Engineer from any and all loss or expense on account thereof, including its use by the OWNER.

**2.4.08 PERMITS:**

All permits and licenses (except as listed hereafter) necessary for the prosecution of the work shall be secured and paid for by the CONTRACTOR. The permits for construction within or across the property, rights-of-way, or easements of highways, railroads, gas lines, electric power transmission lines, water lines, telephone lines, telegraph lines, levees, or other utilities shall be secured and paid for by the OWNER. City of Sanibel Building Dept. permit fees shall be paid for by the OWNER.

**2.4.09 LAWS TO BE OBSERVED:**

The CONTRACTOR shall give all notices and comply with all Federal, State, and local laws, ordinances, and regulations in any manner affecting the conduct of the work, and all such orders and decrees as exist, or may be enacted by bodies or tribunals having any jurisdiction or authority over the work, and shall indemnify and save harmless the OWNER and the Engineer against any claim or liability arising from, or based on, the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or contract for this work in relation to any such law, ordinance, regulations, order or decree, the CONTRACTOR shall forthwith report the same to the Engineer in writing.

1. Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein; and the contract shall be read and enforced as though it were included herein and, if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the contract shall forthwith be physically amended to make such insertion. This shall include but not be limited to the Occupational Safety and Health Act of 1970.

## 2.4.10 WRITTEN NOTICE:

Written notice shall be considered as served when delivered in person or sent by registered mail to the individual, firm, or corporation, or to the last business address of such known to him who serves the notice.

1. Change of Address: It shall be the duty of each party to advise the other parties to the Contract as to any change in his business address until completion of the Contract.

## 2.4.11 ASSIGNMENT OF CONTRACT:

Neither the CONTRACTOR nor the OWNER shall sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of his right, title, or interest therein, or his obligations thereunder, without written consent of the other party.

## 2.4.12 ORAL AGREEMENTS:

No oral order, objection, claim, or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents; and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceeding of any other waiver or modification.

## 2.4.13 WORK DURING AN EMERGENCY:

The CONTRACTOR shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases he shall not wait for instructions before proceeding to properly protect both life and property.

## 2.4.14 WARNING SIGNS AND BARRICADES:

The CONTRACTOR shall provide adequate signs, barricades, warning lights, and watchmen and take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be protected at night by suitable signal lights which shall be kept burning from sunset to sunrise. Barricades shall be of substantial construction and shall be painted such as to increase their visibility at night. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist.

## 2.4.15 PUBLIC CONVENIENCE:

The CONTRACTOR shall at all times so conduct his work as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to insure the protection of persons and property. No road or street shall be closed to the public, except with the permission of the proper authorities. Fire hydrants on or adjacent to the work shall always be kept accessible to fire-fighting equipment. Temporary provisions shall be made by the CONTRACTOR to ensure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed.

## 2.4.16 SAFETY:

In accordance with general accepted construction practices, the CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons and property affected

directly or indirectly by his operations during the performance of the work. This requirement will apply continuously 24 hours per day until acceptance of the work by the OWNER and shall not be limited to normal working hours.

1. The duty of the Engineer to conduct construction review of the CONTRACTOR'S performance is not intended to include review of the adequacy of the CONTRACTOR'S safety measures in, on, or near the construction site.

## 2.4.17 EXISTING CONSTRUCTION:

When new construction is adjacent to or crosses highways, railroads, streets, or utilities under the jurisdiction of State, County, City, or other public agency, public utility, or private entity, the OWNER shall secure written permission from the proper authority before executing such new construction. The CONTRACTOR shall satisfy himself that the OWNER has secured written permission before any work is done. The CONTRACTOR shall acquaint himself with and shall execute the work in accordance with any and all requirements of the written permit. The CONTRACTOR shall replace or repair all existing construction damaged in the execution of this Contract. The CONTRACTOR will be required to furnish a release from the proper authority before final acceptance of the work.

## 2.4.18 SANITARY PROVISIONS:

The CONTRACTOR shall provide and maintain such sanitary accommodations for the use of his employees and those of his sub-contractor's as may be necessary to comply with the requirements and regulations of the local and state departments of health.

## 2.4.19 NONDISCRIMINATION IN EMPLOYMENT:

The CONTRACTOR agrees:

1. That in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no CONTRACTOR, or sub-contractor, shall, by reason of race, religion, color, sex, national origin or ancestry, discriminate against any citizen who is qualified and available to perform the work to which the employment relates;

2. That no CONTRACTOR, sub-contractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, religion, color, sex, national origin or ancestry;

3. The CONTRACTOR agrees to comply with any Federal, State, or local law with respect to nondiscrimination in employment.

# SECTION 2.5 - PROGRESS AND COMPLETION OF WORK

## 2.5.01 NOTICE TO PROCEED:

Following the execution of the Contract by the OWNER and the CONTRACTOR, written Notice to Proceed with work shall be given by the OWNER to the CONTRACTOR. The CONTRACTOR shall begin and shall prosecute the work regularly and uninterruptedly thereafter and not before (except as provided for herein) with such force as to secure the completion of the work within the Contract Time.

## 2.5.02 CONTRACT TIME:

The CONTRACTOR shall complete, in an acceptable manner, all of the work contracted for in the time stated herein. Computation of Contract Time shall commence on the day specified in the Notice to Proceed and every calendar day following, except as herein provided, shall be counted as Contract Time.

## 2.5.03 SCHEDULE OF COMPLETION:

The CONTRACTOR shall submit, at such times as may reasonably be requested by the Engineer, schedules showing the order in which the CONTRACTOR proposes to carry on the work, with dates at which the CONTRACTOR will start the various parts of the work, and estimated date of completion of each part.

## 2.5.04 CHANGES IN THE WORK:

The OWNER may, as the need arises, order changes in the work through additions, deletions, or modifications to the extent of 25% of the original Contract Amount, without invalidating the Contract. Compensation and time of completion affected by the change shall be adjusted at the time of ordering such change.

## 2.5.05 EXTRA WORK:

New and unforeseen items of work found to be necessary and which cannot be covered by any item or combination of items for which there is a Contract price, shall be classed as Extra Work. The CONTRACTOR shall do such Extra Work and furnish such materials as may be required for the proper completion or construction of the whole work contemplated, upon written order from the OWNER as approved by the Engineer. In the absence of such written order, no claim for Extra Work shall be considered. Extra Work shall be performed in accordance with these Contract Documents where applicable and work not covered by such shall be done in accordance with the best construction practice and in a workmanlike manner. Extra Work required in an emergency to protect life and property shall be performed by the CONTRACTOR as required.

## 2.5.06 EXTENSION OF CONTRACT TIME:

A delay beyond the CONTRACTOR'S control occasioned by an Act of God, by act or omission on the part of the OWNER, or by strikes, lockouts, fire, etc., may entitle the CONTRACTOR to an extension of time in which to complete the work as agreed by the OWNER, provided, however, that the CONTRACTOR shall immediately give written notice to the OWNER of the cause of such delay.

1. Act of God shall mean an earthquake, flood, cyclone, or other cataclysmic phenomenon of nature. Rain, wind, flood, or other natural phenomenon of normal intensity for the locality shall not be construed as an Act of God, and no reparation shall be made to the CONTRACTOR for damages to the work resulting therefrom.

## 2.5.07 USE OF COMPLETED PORTIONS:

The OWNER shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the completion of uncompleted work or causes refinishing of completed work, the

CONTRACTOR shall be entitled to such extra compensation or extension of time or both, as agreed by the OWNER.

## 2.5.08 REMOVAL OF CONSTRUCTION EQUIPMENT, TOOLS, AND SUPPLIES:

At the termination of this Contract, before acceptance of the work by the OWNER, the CONTRACTOR shall remove all of his equipment, tools, and supplies from the property of the OWNER. Should the CONTRACTOR fail to remove such equipment, tools, and supplies, the OWNER shall have the right to remove them at the expense of the CONTRACTOR.

## 2.5.09 CLEANING UP:

The CONTRACTOR shall remove from the OWNER'S property, and from all public and private property, all temporary structures, rubbish, and waste materials resulting from his operation or caused by his employees, and shall remove all surplus materials leaving the site smooth, clean, and true to line and grade.

## 2.5.10 ENGINEER'S CERTIFICATE OF SUBSTANTIAL COMPLETION:

When the work to be performed under this Contract is substantially completed in accordance with the Contract Documents, the Engineer shall prepare an Engineer's Certificate of Substantial Completion to be acknowledged and accepted by the OWNER and the CONTRACTOR. The Certificate may list items to be completed or corrected, but such Certificate shall not relieve the CONTRACTOR of his obligation to complete all work, whether listed or not, in accordance with the Contract Documents nor will it preclude any right the OWNER may have for recourse in accordance with the Contract Documents.

## 2.5.11 TERMINATION OF CONTRACTOR'S RESPONSIBILITY:

The Contract will be considered complete when all work has been finished, the final review made up by the Engineer, and the project accepted in writing by the OWNER. The CONTRACTOR'S responsibility shall then cease, except as set forth in his Performance and Payment Bond, as provided in Paragraph 2.3.08 Guaranty, and as provided in Paragraph 2.5.12 Correction of Faulty Work After Final Payment.

## 2.5.12 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT:

The making of the final payment by the OWNER to the CONTRACTOR shall not relieve the CONTRACTOR of responsibility for faulty materials or workmanship. The CONTRACTOR shall promptly replace any such defects discovered within one year from the date of written acceptance of the work.

## 2.5.13 LIQUIDATED DAMAGES:

In the event the CONTRACTOR fails to complete satisfactorily the entire work contemplated and provided for under this contract on or before the date of completion determined as described elsewhere herein, the OWNER shall deduct from the monies due to CONTRACTOR the sum of One ~~Thousand Five~~ Hundred Dollars ($1~~,5~~00.00) for each calendar day of delay, which sum is agreed upon not as a penalty but as a fixed and liquidated damage for each day of such delay, to be paid in full and subject to no deduction, it being understood and agreed that the time of completion is of the essence. If the monies due the CONTRACTOR are less than the amount of such liquidated damages, then the CONTRACTOR shall pay the balance to the OWNER.

## 2.5.14 INCENTIVE CLAUSE:

The City of Sanibel will pay the CONTRACTOR an "Incentive Bonus" in the sum of One Hundred Dollars ($100.00) for each calendar day if the work in the Contract is completed in accordance with the Contract Documents, as determined by the Engineer, before the documented project completion date.

The parties anticipate that delays may be caused by or arise from any number of events during the course of the Contract, including, but not limited to, work performed, work deleted, change orders, supplemental agreements, delays, disruptions, differing site conditions, utility conflicts, design changes or defects, time extensions, extra work, right-of-way issues, permitting issues, actions of Suppliers, sub-contractor's or other CONTRACTOR'S, actions by third parties, shop drawing approval process delays, expansion of the physical limits of the project to make it functional, weather, weekends, holidays, suspension of CONTRACTOR'S operations, or other such events, forces or factors sometimes experienced in construction work. Such delays or events and their potential impacts on performance by the CONTRACTOR are specifically contemplated and acknowledged by the parties in entering into this Contract and shall not extend the "Incentive Bonus" Completion Date set forth above.

# SECTION 2.6 – PAYMENTS TO CONTRACTOR

## 2.6.01 DETAILED BREAKDOWN OF CONTRACT AMOUNT:

Except in cases where unit prices form the basis for payment under the Contract, the CONTRACTOR shall, within ten days of receipt of Notice to Proceed, submit a complete breakdown of the Contract Amount showing the value assigned to each part of the work, including an allowance for profit and overhead. Upon approval of the breakdown of the Contract Amount by the Engineer, it shall be used as the basis for all Requests for Payment.

## 2.6.02 REQUESTS FOR PAYMENT:

Progress Payments. OWNER may make progress payments on the project based on the CONTRACTOR'S Applications for Payment as recommended by the Engineer during construction as provided below.

1. Prior to Substantial Completion progress payments will be in an amount equal to 90% of the Work completed, and 90% of materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.

2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 95% of the Contract Price, less such amounts as Engineer shall determine in accordance with paragraph 2.6.05 of the General Conditions.

## 2.6.03 DELETED

## 2.6.04 OWNER'S ACTION ON REQUEST FOR PAYMENT:

Within 30 days after receipt of a Request for Payment from the CONTRACTOR, the OWNER shall:

1. Process the Request for Payment as recommended by the Engineer.

2. Pay such other amount, in accordance with Paragraph 2.6.05, as he shall decide is due the CONTRACTOR, informing the CONTRACTOR and the Engineer in writing of his reasons for paying the amended amount.
3. Withhold payment in accordance with Paragraph 2.6.05, informing the CONTRACTOR and the Engineer of his reasons for withholding payment.

**2.6.05 OWNER'S RIGHT TO WITHHOLD PAYMENT OF A REQUEST FOR PAYMENT:**

The OWNER may withhold payment, in whole or in part, of a Request for Payment to the extent necessary to protect himself from loss on account of any of the following:

1. Defective work.

2. Evidence indicating the probable filing of claims by other parties against the CONTRACTOR which may adversely affect the OWNER.

3. Failure of the CONTRACTOR to make payments due to sub-contractor's, material suppliers, or employees.

4. Damage to another CONTRACTOR.

**2.6.06 PAYMENT FOR UNCORRECTED WORK:**

Should the OWNER direct the CONTRACTOR not to correct work that has been damaged or that was not performed in accordance with the Contract Documents, an equitable deduction from the Contract Amount shall be made to compensate the OWNER for the Uncorrected work.

**2.6.07 PAYMENT FOR REMOVAL OF REJECTED WORK AND MATERIALS:**

The removal of work and materials rejected in accordance with Paragraph 2.3.05 and the re-execution of acceptable work by the CONTRACTOR shall be at the expense of the CONTRACTOR, and he shall pay the cost of replacing the work of other CONTRACTOR'S destroyed or damaged by the removal of the rejected work or materials and the subsequent replacement of acceptable work.

1. Removal by OWNER: Removal of rejected work or materials and storage of materials by the OWNER, in accordance with Paragraph 2.3.05, shall be paid by the CONTRACTOR within 30 days after written notice to pay is given by the OWNER. If the CONTRACTOR does not pay the expenses of such removal and after ten days written notice being given by the OWNER of his intent to sell the materials, the OWNER may sell the materials at auction or at private sale and will pay the CONTRACTOR the net proceeds therefrom after deducting all the costs and expenses that should have been borne by the CONTRACTOR.

**2.6.08 PAYMENT FOR EXTRA WORK:**

Written notice of claims for payment for Extra Work shall be given by the CONTRACTOR within ten days after receipt of instructions from the OWNER to proceed with the Extra Work and before any work is commenced, except in an emergency endangering life or property. No claim shall be valid unless so made. In all cases, the CONTRACTOR'S itemized estimate sheets showing all labor and material shall be submitted to the OWNER. The OWNER'S order for Extra Work shall specify any extension of the Contract Time and one of the following methods of payment.

1. Unit prices or combinations of unit prices which formed the basis of the original Contract.

2. A lump sum based on the CONTRACTOR'S estimate and accepted by the OWNER.

3. Actual cost plus 15% for overhead and profit. Actual costs are defined as follows:

   A. Labor costs, including all allowances for holidays, vacation, sick leave, apprentice programs, hospitalization, or other "fringe benefits" and including time of foreman while engaged directly upon extra work.

   B. Labor insurance and taxes.

   C. Materials and supplies used on the work.

   D. Associated General CONTRACTOR'S of America standard rental rates on each piece of equipment having a value in excess of $50.00. Equipment and tools of lesser value are considered "small tools" and, as such, are considered to be part of overhead.

## 2.6.09 PAYMENT FOR WORK SUSPENDED BY THE OWNER:

If the work or any part thereof shall be suspended by the OWNER and abandoned by the CONTRACTOR as provided in Paragraph 2.2.01 d., Suspension of Work by OWNER, the CONTRACTOR will then be entitled to payment for all work done on the portions so abandoned, plus 15% of the value of the abandoned work to compensate for overhead, plant expense, and anticipated profit.

## 2.6.10 PAYMENT FOR WORK BY THE OWNER:

The cost of the work performed by the OWNER, in removing construction equipment, tools, and supplies in accordance with Paragraph 2.5.08, Removal of Construction Equipment, Tools, and Supplies, and in correcting deficiencies in accordance with Paragraph 2.2.01 e., OWNER'S Right to Terminate the Agreement and Complete the Work shall be paid by the CONTRACTOR.

## 2.6.11 PAYMENT FOR WORK BY THE OWNER FOLLOWING HIS TERMINATION OF THE CONTRACT:

Upon termination of the Contract by the OWNER in accordance with Paragraph 2.2.01 e., OWNER'S Right to Terminate Agreement and Complete the Work, no further payments shall be due the CONTRACTOR until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the CONTRACTOR. If the cost of completing the work shall exceed the unpaid balance, the CONTRACTOR shall pay the difference to the OWNER. The cost incurred by the OWNER, as herein provided, and the damage incurred through the CONTRACTOR'S default, shall be certified by the OWNER.

1. Unpaid Balance: If the unpaid balance of the Contract Sum exceeds the cost of finishing the work, including compensation for the Engineer's additional services, such shall be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR shall pay the difference to the OWNER. The cost incurred by the OWNER as herein provided shall be certified by the Engineer.

## 2.6.12 PAYMENT FOR WORK TERMINATED BY THE CONTRACTOR:

Upon suspension of the work or termination of the Contract by the CONTRACTOR in accordance with Paragraph 2.2.02f, CONTRACTOR'S Right to Suspend Work or Terminate Agreement, the CONTRACTOR shall recover payment from the OWNER for the work performed, plus loss on plant and materials, plus established profit and damages.

## 2.6.13 PAYMENT FOR SAMPLES AND TESTING OF MATERIALS:

Samples furnished in accordance with Paragraph 2.3.02, Samples, shall be furnished by the CONTRACTOR at his expense and may be used in the work, after acceptance.

1. Testing of samples and materials furnished in accordance with Paragraph 2.3.02, Samples, shall be arranged and paid for by the OWNER.

## 2.6.14 ACCEPTANCE AND FINAL PAYMENT:

When the CONTRACTOR shall have completed the work in accordance with the terms of the Contract Documents, he shall certify completion of the work to the OWNER and submit a final Request for Payment, which shall be the Contract Amount plus all approved additions, less all approved deductions and less previous payments made. The CONTRACTOR shall furnish evidence that he has fully paid all debts for labor, materials, and equipment incurred in connection with the work, and, upon acceptance by the OWNER, the OWNER will release the CONTRACTOR, except as to the conditions of the Performance and Payment Bond, any legal rights of the OWNER, required guaranties, and Correction of Faulty Work after Final Payment, and will pay the CONTRACTOR'S final Request for Payment. The CONTRACTOR shall allow sufficient time between the time of completion of the work and approval of the final Request for Payment for the Engineer to assemble and check the necessary data.

1. Release of Liens: The CONTRACTOR shall deliver to the OWNER a complete release of all liens arising out of this Contract before the final Request for Payment is paid. If any lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the OWNER such amounts as the OWNER may have been compelled to pay in discharging such liens including all costs and a reasonable attorney's fee.

2. Final Payment: The CONTRACTOR shall be paid in full within 61 days after the date of substantial completion. If within 61 days after substantial completion there remains uncompleted minor items, an amount equal to 200% of the value of each item as determined by the Engineer shall be withheld and paid 61 days following completion of all such items. This payment shall constitute final settlement.

# SECTION 2.7 - CONTROL OF THE WORK

## 2.7.01 GENERAL:

The following general provisions have been taken verbatim from the Florida Department of Transportation Standard Specifications for Road and Bridge Construction with certain modifications to meet specific requirements of the City of Sanibel. The CONTRACTOR is advised to read these provisions very carefully and ensure that he fully understands all of the requirements.

## 2.7.02 PLANS AND WORKING DRAWINGS:

1. Plans and Contract Documents:

   The CONTRACTOR will be furnished an appropriate number of copies of the plans and special provisions as required for the particular project. Copies of the Standard Specifications may be purchased from the Florida Department of Transportation. The CONTRACTOR shall have available on the work, at all times, one copy each of the plans, specifications and special provisions.

2. Plans:

   The plans furnished by the Engineer consist of general drawings showing such details as are necessary to give a comprehensive idea of the construction contemplated. Roadway plans will show in general, alignment, profile grades, typical cross sections and general cross sections. Structure plans, in general, will show in detail all dimensions of the work contemplated. When the structure plans do not show the dimensions in detail, they will show general features and such details as are necessary to give a comprehensive idea of the structure.

3. Alterations in Plans:

   All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made on any plan or drawing after its approval by the Engineer, except by direction of the Engineer.

4. Working Drawings (for Structures):

   A. General:

      The CONTRACTOR shall furnish, on sheets not larger than 24 inches by 36 inches, such working and detail drawings as may be required for any part of the structure and which are not included in plans furnished by the Engineer.

   B. For Steel Structures:

      Working Drawings for steel structures shall consist of shop detail, erection details and other working plans, showing details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.

   C. For Concrete Structures:

      Working drawings for concrete structures shall consist of such detailed plans as may reasonably be required for the effective prosecution of the work and which are not included in plans furnished by the Engineer. These may include details of falsework, bracing centering and formwork, masonry layout diagrams, and diagrams for bending reinforcing steel.

   D. Submission of Working Drawings:

      The CONTRACTOR shall submit to the Engineer for approval three (3) sets of any required detailed shop or working drawings. These drawings shall be submitted in

sufficient time to allow adequate study and discussion and any necessary correction prior to beginning the work they cover. Prior to the approval of these drawings any work done, or materials ordered for the structures involved shall be at the CONTRACTOR'S risk. One set of these drawings will be returned to the CONTRACTOR, either approved or marked with corrections required. The other sets will be retained by the Engineer.

E. Responsibility of Accuracy of Working Drawings:

It is understood, however, that approval by the Engineer of the CONTRACTOR'S working drawings does not relieve the CONTRACTOR of any responsibility for accuracy of dimensions and details, or for conformity of dimensions and details. The CONTRACTOR shall be responsible for agreement and conformity of his working drawings with the approved plans and specifications.

F. Cost of Working Drawings:

The contract prices shall include the cost of furnishing all working drawings, and the CONTRACTOR will be allowed no extra compensation for such drawings.

## 2.7.03 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS:

These Specifications, the plans, special provisions, and all supplementary documents are integral parts of the contract, and a requirement occurring in one is as binding as though occurring in all.

They are intended to be complementary and to describe and provide for a complete work. In addition to the work and materials specifically called for in the Specifications as being included in any specific pay item, additional incidental work, not specifically mentioned, will be included in such pay item when so shown in the plans, or if indicated, or obvious and apparent, as being necessary for the proper completion of the work under such pay item and not stipulated as being covered under other pay items. In case of discrepancy, computed dimensions shall govern over scaled dimensions, plans shall govern over Standard Specifications, and special provisions shall govern over both Standard Specifications and Plans.

## 2.7.04 CONFORMITY OF WORK WITH PLANS:

All Work performed, and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the plans or indicated in the specifications.

In the event the Engineer finds the materials or the finished product in which the materials are used not within reasonable close conformity with the plans and specifications, but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials as he deems necessary to conform to his determination based on engineering judgment.

In the event the Engineer finds the materials, or the finished product in which the materials are used, or the work performed are not in reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the CONTRACTOR.

In the event the OWNER accepts the work that is not within these tolerances, appropriate deductions will be made from the actual amount used to cover the cost of the extra material. The amount will be computed based on the job mix formula and the unit price stated in the Contract.

## 2.7.05 ERRORS OR OMISSIONS IN PLANS OR SPECIFICATIONS:

The CONTRACTOR shall take no advantage of any apparent error or omission which he might discover in the plans or specifications but shall forthwith notify the Engineer of such discovery, who will then make such corrections and interpretations as he deems necessary for reflecting the actual spirit and intent of the plans and specifications.

## 2.7.06 AUTHORITY OF THE ENGINEER:

All work shall be available for inspection by the Engineer and performed to his satisfaction.

It is agreed by the parties hereto that the Engineer shall decide all questions, difficulties and disputes, of whatever nature, which may arise relative to the interpretation of the plans, construction, prosecution and fulfillment of the contract, and as to the character, quality, amount and value of any work done, and materials furnished, under or by reason of the contract.

## 2.7.07 AUTHORITY AND DUTIES OF ENGINEER'S ASSISTANTS:

The Engineer may appoint such assistants and representatives as he desires. They shall be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the manufacture, preparation or fabrication of the materials to be used. Such assistants shall not be authorized to revoke, alter or waive any requirement of the specifications. They shall be authorized to call to the attention of the CONTRACTOR any failure of the work or materials to conform to the specifications and contract and shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Engineer. The CONTRACTOR shall be immediately notified in writing of any such suspension of the work and such notice shall state in detail the reasons for the suspension. The presence of the inspector or other assistant shall in no way lessen the responsibility of the CONTRACTOR.

## 2.7.08 CONSTRUCTION STAKES AND MARKERS:

1. Stakes Furnished:

   The CONTRACTOR shall furnish and set, free of charge, slope stakes, grade stakes and all other stakes necessary for construction of the project. The CONTRACTOR shall furnish all templates and other materials necessary for making and maintaining points and lines given and shall furnish the Engineer such incidental labor as he may require in reestablishing points and lines necessary to the prosecution of the work.

2. Special Requirements for Landscape Work:

   For landscape work, the OWNER will furnish all stakes in the size and quantity required and the CONTRACTOR shall set all such stakes with his own forces. The CONTRACTOR shall maintain such stakes in place until the layout is approved and the digging of the holes for the plantings has begun; replacing any which may become destroyed or disturbed during such period.

## 2.7.09 CONTRACTOR'S SUPERVISION:

1. Prosecution of work:

   The CONTRACTOR shall give the work the constant attention necessary to assure the scheduled progress and he shall cooperate fully with the Engineer and with other CONTRACTOR'S at work in the vicinity.

2. CONTRACTOR'S Superintendent:

   The CONTRACTOR shall at all times have on the work as his agent, a competent superintendent capable of thoroughly interpreting the plans and specifications and thoroughly experienced in the type of work being performed, who shall receive the instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Engineer and to supply promptly any materials, tools, equipment, labor and incidentals which may be required. Such superintendence shall be furnished regardless of the amount of work sublet.

3. Supervision for Emergencies:

   The CONTRACTOR shall have a responsible person available at or reasonably near the work site on a 24-hour basis, seven days a week, in order that he may be contacted in emergencies and in cases where immediate action must be taken to maintain traffic or to handle any other problem that might arise. For compliance with this requirement outside of working hours, the furnishing of the telephone number where such person can be reached will suffice.

## 2.7.10 GENERAL INSPECTION REQUIREMENTS:

1. Cooperation by CONTRACTOR:

   No work shall be done, nor materials used, without suitable inspection by the Engineer or his representative, and the CONTRACTOR shall furnish the Engineer with every reasonable facility for ascertaining whether the work performed, and materials used are in accordance with the requirements and intent of the plans and specifications. If the Engineer so requests, the CONTRACTOR shall, at any time before final acceptance of the work, remove or uncover such portions of the finished work as may be directed. After examination, the CONTRACTOR shall restore the uncovered portions of the work to the standard required by the specifications. Should the work so exposed or examined prove unacceptable, the uncovering or removal, and the replacing of the covering or making good of the parts removed, shall be at the CONTRACTOR'S expense. However, should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or making good of the parts removed, shall be paid for as extra work.

2. Failure of Engineer to Reject Work During Construction:

   If, during or prior to construction operations, the Engineer should fail to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject shall in no way prevent his later rejection when such defect is discovered, or obligate the Engineer to final acceptance, and the CONTRACTOR shall make no claim for losses suffered due to any necessary removals or repairs of such defects.

3. Failure to Remove and Renew Defective Materials and Work:

Should the CONTRACTOR fail or refuse to remove and renew any defective materials used or work performed, or to make any necessary repairs in an acceptable manner and in accordance with the requirements of the specifications, within the time indicated in writing, the Engineer shall have the authority to cause the unacceptable or defective materials or work to be repaired, removed and renewed, as may be necessary; all at the CONTRACTOR'S expense. Any expense incurred by the City in making these repairs, removals or renewals, which the CONTRACTOR has failed or refused to make, shall be paid for out of any moneys due or which may become due the CONTRACTOR, or may be charged against the contract bond. Continued failure or refusal on the part of the CONTRACTOR to make any or all necessary repairs promptly, fully and in an acceptable manner shall be sufficient cause for the City, at its option, to perform the work with its own organization, or to contract with any other individual, firm or corporation to perform the work. All costs and expenses incurred thereby shall be charged against the defaulting CONTRACTOR and the amount thereof deducted from any moneys due or which may become due to him or shall be charged against the contract bond. Any work performed, subsequent to forfeiture of the Contract, as described in this Article, shall not relieve the CONTRACTOR in any way of his responsibility for the work performed by him.

## 2.7.11 FINAL CONSTRUCTION INSPECTION:

1. Maintenance Until Final Acceptance:

The CONTRACTOR shall maintain all work in first-class condition until it has been completed as a whole and has been accepted by the Engineer under the provisions of 2.7.12.

2. Semifinal Inspections:

The Engineer will make a semifinal inspection within seven (7) days after notice from the CONTRACTOR of presumptive completion of the entire project. If, at the semifinal inspection, all construction provided for and contemplated by the contract is found completed to the Engineer's satisfaction, such inspection shall constitute the final inspection, as prescribed below. If, however, at any semifinal inspection any work is found unsatisfactory, in whole or in part, the Engineer shall give the CONTRACTOR the necessary instructions as to replacement of material and performance or re-performance of work necessary and prerequisite to final completion and acceptance, and the CONTRACTOR forthwith shall comply with and execute such instructions. Upon satisfactory replacement of material and performance or reperformance of such work, another inspection shall be made, which shall constitute the final inspection if the required material is found to have been replaced and the work completed satisfactorily.

3. Final Inspection:

Whenever all materials have been furnished, all work has been performed, and the construction contemplated by the contract has been satisfactorily completed, the Engineer will make the final inspection.

## 2.7.12 FINAL ACCEPTANCE:

When, upon completion of the final construction inspection, the work is found to be completed satisfactorily, the Engineer shall give the OWNER a written recommendation for acceptance of the work. The OWNER shall then satisfy himself as to the Engineer's recommendation and within five days of said recommendation notify the CONTRACTOR, in writing, of his acceptance of the work.

## 2.7.13 CLAIMS BY CONTRACTOR:

Where the CONTRACTOR deems that extra compensation is due him for work or materials not clearly covered in the contract or not ordered by the Engineer as extra work, as defined herein, the CONTRACTOR shall notify the Engineer in writing of his intentions to make claim for extra compensation, before he begins the work on which he bases the claim. If such notification is not given, and the Engineer is not afforded proper opportunity for keeping strict account of actual cost, as defined for force account, then the CONTRACTOR thereby agrees to waive the claim for such extra compensation. Such notice by the CONTRACTOR, and the fact that the Engineer has kept account of the cost as aforesaid, shall not in any way be construed as establishing the validity of the claim. In such case the claim after consideration by the Engineer, is found to be valid, it shall be allowed and paid for as extra as provided herein.

# SPECIAL PROVISIONS

1. REFERENCE SPECIFICATIONS – Florida Building Code (FBC) 2023 - 8th Edition with all current revisions and supplements; Florida Fire Prevention Code (FFPC) 2023 - 8th edition with all current revisions and supplements, (includes Florida versions of NFPA 1 & NFPA 101, 2024 edition); Sea Turtle Regulations; Department of Environmental Protection Bureau of Beaches and Coastal Systems; All other Federal, State and Local Codes and Ordinances which may be in effect for this construction location.

2. The Contractor shall be responsible for applying for a City of Sanibel Building Department construction permit for the project. The City shall be responsible for payment of fees for the Sanibel Building Department permits. Required licensing costs and any other miscellaneous fees associated with the project shall be paid for by the Contractor. All required environmental permits shall be secured by the City. Contractor must possess a valid State of Florida Certified General Contractor License (CGC) at the time of the bid opening.

3. The contractor shall be responsible for all survey construction layout.

4. The Contractor shall dispose of all debris such as trees, brush, stumps and other deleterious material at location off the Island of Sanibel. No extra compensation will be allowed for hauling and providing the off-island disposal areas.

5. The Contractor is advised that he may not enter upon private property adjacent to the project without written consent of the affected property owner. A copy of the permission document shall be given to the Engineer.

6. The Contractor is hereby advised that he may not engage in any work on private property in the City of Sanibel during the contract performance period without written permission from the City of Sanibel. Failure to comply with this provision may result in suspension of all work activities until the matter is resolved.

   An example of such work would be the paving of a private driveway. If the Contractor paves the driveway and the property owners does not possess the proper City permits, the entire project might be stopped until the necessary permits are obtained. The delay could be months and the Contractor could be assessed for liquidated damages.

7. No allowance for time extension of the project will be made for weather conditions common to Southwest Florida during the contract time period. The Contractor is reminded that time is of the essence and the work should proceed as quickly and efficiently as possible.

8. The Contractor shall remove and relocate as necessary all mailboxes, street signs, post fences structures such as headwalls, pipes, etc., and any other item necessary for progress and completion of the work. Payment shall be incidental to other items of work.

9. The Contractor shall include the adjustment of those structures (manholes, valves, etc.) that are required to be adjusted for the satisfactory completion of the work. These structures shall be of reinforced concrete or may be brick masonry if circular and constructed in place and shall include the necessary metal frames and gratings. No payment will be made for these items.

10. The contractor will ensure that the roadway and bridges over which he hauls materials will be kept clear. If spoil material and water fall from the truck onto the roadway, the contractor will keep the road clear at all times, either by power broom or by whatever means is necessary, if excessive material continues to be deposited, the Engineer will require hauling to be discontinued until the situation is resolved.

11. Contractor responsible for any temporary markings (i.e. signs, barricades, Striping, caution tape) to assure traffic safety (Vehicular, Pedestrian and Bicycle traffic).

12. All subcontractors must be approved in writing by the City.

13. All soil and concrete tests will be made by a laboratory approved of by the Engineer. Cost of testing will be paid for by the Owner except all subsequent tests deemed necessary because the original test indicated that the work did not conform to specifications. These tests shall be paid for by the contractor. The location of these tests shall be determined by the Owner.

14. An As-Built survey of the project shall be performed and submitted to Owner prior to final acceptance. The survey shall be conducted in accordance with the standards set forth in Chapter 472 of the Florida Statutes and the Minimum Technical Standards for such surveys as specified in Chapter 61G17 of the Florida Administrative Code. The cost of the survey shall be borne by the Contractor.

15. The Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operation that will disturb the natural protection. Install silt barriers or screens for capturing sediments/solids from erosion and dewatering / jetting activities.

16. The Contractor must be in possession of or obtain from the City of Sanibel an Occupational Registration and if applicable a Vegetation Competency Card prior to the start of the contract work to be done.

17. The Contractor is responsible to pay all toll fees required by Lee County to use the Sanibel Causeway.

18. Contractor is responsible for preventing any workers on this project, including all subcontractors, from feeding alligators anywhere on Sanibel Island. Contractor is required to instruct all workers and subcontractors not to eat lunch on the edge of any waterbody on Sanibel Island and not to feed, tease or interact in any way with any alligators, which is illegal under state law. Signage provided by the City regarding alligator feeding shall be posted on all job sites in a clearly visible location. Project sites adjacent to open water of any kind shall have a minimum of two additional alligator signs posted in clearly visible locations near the water's edge. All job sites shall be maintained free of any open containers of food or any food-related garbage. All workers on this project are to be informed that the City takes this issue very seriously and will prosecute any violators to the full extent of this law. State penalties for violating this law include a fine of up to $500 per incidence and up to 60 days in jail. Failure to inform workers of the prohibition against feeding alligators as required above or evidence of alligators being fed by workers on this project, either at the project site or elsewhere on Sanibel Island, will result in immediate revocation of this contract.

19. Payment for work items in this contract is based on actual quantities with unit cost as per the bid schedule. The owner reserves the right to adjust quantities up to twenty-five percent (25%) over or underestimated quantities at contract unit prices. Any increase of work items shall be based on unit prices of similar work items in the vicinity. Any such adjustment resulting in the increase of the total contract price must be approved by the City Council.

20. It is up to the contractor to verify the correct scaling for printed plan documents of electronic documents provided by the City.

21. The contractor shall work on one of the main HVAC systems within the Police wing at a time. The other systems shall remain operational at all times to provide cooling to the wing. The contractor shall provide a minimum of three (3) temporary room/space air conditioning units in the working area during demolition or shall be in compliance with instructions on engineer's plans for temporary cooling. Temporary units' tonnage shall match or exceed that of the removed units. Condensate removal, hoses, and flexible exhaust duct shall be provided for to an exterior opening. Coordinate circuits used with area so as not to shut systems off with the Project Manager. Adequate temporary cooling shall also be provided for all other areas during HVAC system replacement. Contractor will be required to submit a phased work plan, including provisions for temporary air conditioning units, for engineer approval prior to commencement of any work.

22. Final HVAC system commissioning will be required. Contractor shall be responsible for all commissioning requirements including completion of checklists and submission of necessary testing, certifications and paperwork.

23. This project is within a sensitive area of the Sanibel City Hall building. City may require background checks of workers before they will be permitted to work on this project. See background check authorization form.

# AUTHORIZATION FOR BACKGROUND CHECK

**THIS AUTHORIZATION** made and executed this _____ day of _____, _____, by _____, (hereinafter called "CONTRACTOR").

**WITNESSETH:**

CONTRACTOR hereby voluntarily authorizes the City of Sanibel (hereinafter called "CITY"), to conduct a full and complete background check on CONTRACTOR for purposes of checking relevant information relating to CONTRACTOR'S background and work history prior to entering into any agreements or contracts with CITY. CITY and CONTRACTOR both acknowledge that any cost arising out of such background check shall be borne by the CITY.

**CONTRACTOR:**

By: _____
Contractor or Authorized Representative
Printed Name: _____
Title: _____

_____
Contractor Name

_____
Contractor Address

_____
Contractor Phone & Fax Numbers

STATE OF _____ )
COUNTY OF _____ )

The foregoing instrument was acknowledged before me this _____ day of _____, _____, by _____, (name), _____(title), who is personally known to me or who has produced _____ as identification and who did (did not) take an oath.

(Notary Seal)

_____
Signature of Notary Public

_____
(Printed Name of Notary Public)

APPROVED AS TO FORM: Kenneth B. Cuyler, City Attorney Date 11/10/10

# Contract Documents-Technical Specifications

## City of Sanibel

City Hall Finance & IT Wing HVAC Replacement Project

CONTRACT NO: ITB-PW-3-2026/SK

August 8, 2025

THESE CONTRACT DOCUMENTS ARE FOR USE WITH THE CONSTRUCTION PLANS PREPARED BY WESTON & SAMPSON ENGINEERS, INC. ENTITLED

*This document includes technical specifications that have been developed by others and are considered as "standards" for the City of Sanibel. These technical specifications have been reviewed by the undersigned Engineer-of-Record and have been deemed acceptable for use on this project.*


_____
Rafael Jimenez Velez, P.E., F.R.S.E., S.I.
FL P.E. License No. 84876

_____
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# TECHNICAL SPECIFICATIONS TABLE OF CONTENTS

Technical specifications numbering and content correspond to Construction Specifications Institute's MasterFormat standard. Content has been edited to reflect project requirements.



**END OF SECTION**

SECTION 011216

SCOPE AND SEQUENCE OF WORK

PART 1 – GENERAL

1.1. WORK INCLUDED:

A. Complete replacement of the existing air handling units, compressors, refrigerant piping, electrical disconnect switches, and controls at the IT, Finance and Admin wings of the City Hall building as shown on drawings. Existing ductwork shall be cleaned and disinfected before connecting new air handling units. Install new galvanized Unistrut framing to support compressors 4 & 5. All compressors shall be anchored to resist an ultimate design wind speed of 162 mph.

B. Contractor shall provide portable cooling units for the duration of the work.

C. Contractor shall repair any removal or damage to building finishes (including but not limited to drywall ceiling, ceiling tiles, floor tiles, doors, walls, ceiling hatches, among others) required or caused by the work.

1.2. RELATED WORK:

A. SECTION 011100 – CONTROL OF WORK AND MATERIALS

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL:

A. The Contractor shall be responsible for scheduling its activities and the activities of any subcontractors involved, to meet the completion date, or milestones, established for the contract. Scheduling of the work shall be coordinated with the Owner and Engineer.

B. The Construction Sequence Requirements shall be used by the Contractor to form a complete schedule for the project, which shall be coordinated with the Owner and Engineer. Prior to performing any work at the site, the Contractor shall submit a detailed plan to the Engineer for review. The plan shall describe the proposed sequence, methods, and timing of the work.

3.2 CONSTRUCTION SEQUENCING REQUIREMENTS:

A. Contractor shall submit work sequence for review

B. Contractor shall coordinate work schedule with Owner.

C. Contractor shall install barriers to protect building interiors from dust.

D. Contractor shall phase work in IT Room such that one existing AC unit remains operational at all times.

E. Contractor shall repair any removal or damage to building finishes (including but not limited to drywall ceiling, ceiling tiles, floor tiles, doors, walls, ceiling hatches, among others) required or caused by the work.

END OF SECTION 011216

SECTION 012200

MEASUREMENT AND PAYMENT

(Supplemental)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Explanation and Definitions

B. Measurement

C. Payment

D. Schedule of Values

1.2 EXPLANATION AND DEFINITIONS

A. The following explanation of the Measurement and Payment for the Bid Schedule items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the Bid Schedule or relieve the CONTRACTOR of the necessity of furnishing such as a part of the Contract.

1.3 MEASUREMENT

A. The quantities set forth in the Bid Schedule are approximate and are given to establish a uniform basis for the comparison of bids. The CITY reserves the right to increase or decrease the quantity of any class or portion of the work during the progress of construction in accord with the terms of the Contract.

B. Project Restoration: Restoration Work items that will be measured for payment are identified on the bid form and are described in the technical specifications. No other restoration items will be measured for payment, nor will payment be made for their work. These prices and payment shall constitute full and complete payment for all project restoration. The costs of all other restoration items which the contractor anticipates will be required shall be merged with the appropriate bid item. No further payment will be made to repair damage caused by the contractor, his subcontractors, employees, suppliers, or others associated with his operations.

C. Restoration of Private Property: All costs for restoration on private property will be considered incidental to the unit price to install the service. Contractor shall assess each service to be installed to determine which means of construction should be used and coordinate with the OWNER to incur the least amount of disturbance to private property. No payment will be made to repair or restore private property under other payment items.

1.4 PAYMENT

A. Make payment for the items listed on the Bid Schedule on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, clean up, restoration of disturbed areas, and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications.

B. Unit prices are used as a means of computing the final figures for bid and Contract purposes, for periodic payments for work performed, for determining value of additions or deletions and wherever else reasonable.

1.5 SCHEDULE OF VALUES

A. Approval of Schedule: Submit for approval a preliminary schedule of values, in duplicate, for all of the Work. Prepare preliminary schedule in accordance with the General and Supplemental Conditions. Submit preliminary schedule of values within 10 calendar days after the Effective Date of the Agreement. Submit final schedule of values in accordance with the General and Supplemental Conditions.

B. Format: Utilize a format similar to the BID FORM, which will be part of the Contract Documents. Identify each line item with number and title of the major specification items. Identify site mobilization, bonds, and insurance. Include within each line item, a direct proportional amount of CONTRACTOR's overhead profit.

C. Revisions: With each Application for Payment, revise schedule to list approved Change Orders.

1.6 APPLICATIONS FOR PAYMENT

A. Required Copies: Submit three copies of each application on EJCDC Form No. C620 (2013 Ed.) or approved equal. Present required information in typewritten form or on electronic media printout.

B. Execute certification by signature of authorized officer.

C. Use data from approved Schedule of Values.

D. Stored Materials: When payment for materials stored is permitted, submit a separate schedule for Materials Stored showing line item, description, previous value received, value incorporated into the Work and present value.

E. Change Orders: List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of work.

F. Final Payment: Prepare Application for Final Payment as required in the General Conditions.

G. Submit an updated construction schedule for each Application for Payment.

H. Submit application for payment to ENGINEER on, or before, the 2nd Friday of each month.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

A. Make payment on the basis of work actually performed completing each item in the Bid, such work including, but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, cleanup, and all other appurtenances to complete the construction and installation of the work to the configuration and extent as shown on the drawings and described in the specifications. Payment for each item includes compensation for cleanup and restorations.

LUMP SUM PAY ITEMS

PAY ITEM 1 – HVAC REPLACEMENT (LS)

1. Mobilization: Payment for mobilization will be made for at the Contract lump sum price.

2. Performance and Payment Bond Premiums and Insurance: Payment for performance and payment bond will be made for at the Contract lump sum price.

3. Removal and disposal of existing air conditioning units: Payment for removal and disposal of two air handling units, two compressors and two split systems (condensing and air handling units) and associated refrigerant and refrigerant piping as shown on the Plans will be the Contract lump sum price. This includes labor, equipment, tools, transportation and final disposal costs.

4. Furnish and install two 6-ton air conditioning slit systems and three 2-ton air conditioning heat pump split systems, with associated refrigerant piping, electrical supply components, connection to existing ductwork and related controls as shown on the Plans will be the Contract lump sum price.

5. Other work: Work not described above but shown on the Plans and specifications including building finishes work or repairs required to complete installation of the work will be the Contract lump sum price.

END OF SECTION 012200

SECTION 230500

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification, apply to this and the other sections of Division 23.

1.2 SUMMARY

A. This Section includes general administrative and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:

1. Submittals
2. Record documents
3. Maintenance manuals
4. Delivery, storage and handling
5. Rough in
6. Mechanical installations
7. Cutting and patching
8. Painting and finishing
9. Concrete bases
10. Erection of metal supports and anchorage
11. Demolition
12. Grouting
13. Welding

B. All work, materials and equipment supplied and installed under this Division shall comply with appropriate edition of the following codes as amended by the governing body:

1. 2023 Florida Building Code

2. 2023 Florida Mechanical Code

3. 2023 Florida Building Code, Chapter 13 Energy

4. The National Fire Codes, NFPA

5. National Electrical Code, NFPA

6. O.S.H.A. Standards

7. Local /Codes and Regulations

1.3 SUBMITTALS

A. Follow the procedures specified in Division 1.

1.4 RECORD DOCUMENTS

A. Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.

B. Equipment locations (exposed and concealed), dimensioned from prominent building lines.

C. Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.5 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1. In addition to the requirements specified in Division 1, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

2. Manufacturer's printed operating procedures to include start up, break in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions.

3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

4. Servicing instructions and lubrication charts and schedules.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS

2.1 REQUIREMENTS

A. Product requirements for equipment, ductwork, piping, insulation and controls are listed in other Division 23 Sections

PART 3 - EXECUTION

3.1 Contractor is to coordinate all proposed ductwork and equipment with all other trades. Immediately notify the project Engineer through the Architect of any conflicts.

3.2 ROUGH IN

A. Verify final locations for rough ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications on plans for rough in requirements.

3.3 MECHANICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other building components.

2. Verify all dimensions by field measurements.

3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

4. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.

5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service

companies, and controlling agencies. Provide required connection for each service.

8. Install systems, materials, and equipment to conform with approved submittal data, to the greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer the conflict to the Architect.

9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

11. Install systems, materials, and equipment giving right of way priority to systems required to be installed at a specified slope.

B. EQUIPMENT INSTALLATION – COMMON REQUIREMENTS

1. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.

2. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.

3. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.

4. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

5. Install equipment giving right of way to piping systems installed at a required slope.

C. PIPING SYSTEMS – COMMON REQUIREMENTS

1. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15 specify piping installation requirements unique to the piping system.

2. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, except where deviations to layout are approved by Architect.

3. Install piping at indicated slope.

4. Install components having pressure rating equal to or greater than system operating pressure.

5. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

6. Install piping free of sags and bends.

7. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

8. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

9. Install piping to allow application of insulation plus 1 inch (25mm) clearance around insulation.

10. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

11. Install fittings for changes in direction and branch connections.

12. Install couplings according to manufacturer's printed instructions.

13. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:

    a. Chrome Plated Piping: Cast brass, one piece, with set screw, and polished chrome plated finish. Use split casting escutcheons, where required, for existing piping.

14. Sleeves are not required for core drilled holes.

15. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.

16. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, concrete floor and roof slabs, and where indicated.

    a. Cut sleeves to length for mounting flush with both surfaces.

    b. Build sleeves into new walls and slabs as work progresses.

    c. Install large enough sleeves to provide 1/4 inch (6mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

17. Steel Sheet Metal Sleeves: For pipes 6 inches (150 mm) and larger that penetrate gypsum board partitions.

18. Cast Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches (50 mm) above finished floor level.

    a. Except for below grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using an elastomeric joint sealant.

19. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1 inch (25mm) annular clear space between pipe and sleeve for installation of mechanical seals.

    a. Install sheet metal sleeves for pipes smaller than 4 inches (150 mm).

    b. Install cast-iron wall pipes for sleeves 4 inches (150 mm) and larger.

    c. Assemble and install mechanical seals according to manufacturer's printed instructions.

20. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron wall pipes for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1 inch (25mm) annular clear space between pipe and sleeve for installation of mechanical seals.

21. Fire Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire stopping sealant material.

22. Verify final equipment locations for roughing in.

23. Refer to equipment specifications in other Sections for roughing in requirements.

24. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system Sections.

    a. Soldered Joints: Construct joints according to AWS "Soldering Manual," Chapter 22 "The Soldering of Pipe and Tube."

    b. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:

Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.

25. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).

26. Align threads at point of assembly.

27. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.

28. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

E. Plastic Pipe and Fitting Solvent Cement Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join pipe and fittings according to the following standards:

1. Comply with ASTM F 402 for safe handling of solvent cement and primers.

2. Chlorinated Poly (Vinyl Chloride) (CPVC): ASTM D 2846 and ASTM F 493.

3. Poly (Vinyl Chloride) (PVC) Non Pressure Application : ASTM D 2855.

4. Piping Connections: Except as otherwise indicated, make piping connections as specified below.

a. Install unions in piping 2 inches (50 mm) and smaller adjacent to each valve and at final connection to each piece of equipment having a 2 inch (50mm) or smaller threaded pipe connection.

## 3.4 CUTTING AND PATCHING

A. General: Perform cutting and patching in accordance with Division 1. In addition to the requirements specified in Division 1, the following requirements apply:

1. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.

2. Remove and replace defective Work.

3. Remove and replace Work not conforming to requirements of the Contract Documents.

4. Remove samples of installed Work as specified for testing.

5. Install equipment and materials in existing structures.

6. Upon written instructions from the Architect, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.

C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating and cooling units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work. See drawings for additional information.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas, and/or to provide weather protection of exterior openings during demolition activities.

1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

## 3.5 PAINTING AND FINISHING

A. Damage and Touch Up: Repair marred and damaged factory painted finishes with materials and procedures to match original factory finish.

## 3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

## 3.7 DEMOLITION

A. Disconnect, demolish, and remove work specified under 23 /15 and as indicated.

B. Where pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.

C. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.

D. Abandoned Work: Cut and remove buried pipe abandoned in place, 2 inches (50 mm) beyond the face of adjacent construction. Cap and patch surface to match existing finish.

E. Removal: Remove indicated equipment from the Project site.

F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.

## 3.8 GROUTING

A. Install nonmetallic non shrink grout for mechanical equipment base bearing surfaces, equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.

B. Clean surfaces that will come into contact with grout.

C. Provide forms for placement of grout, as required.

D. Avoid air entrapment when placing grout.

E. Place grout to completely fill equipment bases.

F. Place grout on concrete bases to provide a smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout according to manufacturer's printed instructions.

3.9 WELDING

A. GENERAL

1. All welding shall comply with the provisions of the latest revision of applicable codes, whether ASME Boiler and Pressure Vessel Code for pressure piping or such State and Local requirements as may supersede these codes.

2. Welds shall be of sound metal thoroughly fused to the base material at all points, free from cracks and reasonable free from oxidation flow holes and non-metallic inclusions. No fins or weld metal shall project within the pipe and should they occur, they shall be removed. All pipe beveling shall be done by machine. The surface of all parts to be welded shall be thoroughly cleaned free from paints, oil, rust or scale at the time of welding, except that a light coat of oil may be used to preserve the beveled surfaces from rust.

3. Pipe and fitting shall be carefully aligned with adjacent parts and this alignment must be preserved in a rigid manner during the process of welding.

4. The contractor shall be responsible for the quality of welding done and shall repair, or replace, any work not done in accordance with the specifications. If required by the Architect/Engineer, the contractor shall cut out at least three (3) welds during the job for X-raying and testing. These welds shall be selected at random by the inspector and shall be tested as part of the contractor’s scope of work. Certifications of these tests shall be submitted in triplicate to the Engineer. In case a faulty weld is discovered, the contractor shall be required to furnish additional tests.

END OF SECTION 230500

SECTION 230529

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes hangers and supports for mechanical systems piping and equipment.

1.3 DEFINITIONS

A. Terminology used in this Section is defined in MSS SP-90.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of hanger and support.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Hangers, Supports, and Components: Factory-fabricated according to MSS SP-58.

1. Components include galvanized coatings where installed for piping and equipment that will not have a field-applied finish.

2. Pipe attachments include nonmetallic coating for electrolytic protection where attachments are in direct contact with copper tubing.

B. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.

2.2 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36 (ASTM A 36M), steel plates, shapes, and bars, black and galvanized.

B. Bolts and Nuts: ASME B18.10 or ASTM A 183, steel, hex-head, track bolts and nuts.

C. Washers: ASTM F 844, steel, plain, flat washers.

D. Grout: ASTM C 1107, Grade B, non-shrink, nonmetallic.

1. Characteristics include post-hardening, volume-adjusting, dry, hydraulic-cement-type grout that is non-staining, non-corrosive, non-gaseous and is recommended for both interior and exterior applications.

2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

3. Water: Potable.

4. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. General: Comply with MSS SP-69 and SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible.

C. Install supports with maximum spacing complying with MSS SP-69.

D. Where pipes of various sizes are supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.

E. Install building attachments within concrete or to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert to forms. Install reinforcing bars through openings at top of inserts.

F. Install concrete inserts in new construction prior to placing concrete.

G. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install according to fastener manufacturer's written instructions. Do not use in lightweight concrete slabs or in concrete slabs less than 4 inches (100 mm) thick.

H. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

I. Heavy-Duty Steel Trapezes: Field-fabricate from ASTM A 36 steel shapes selected for loads being supported. Weld steel according to AWS D-1.1.

J. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so that maximum pipe deflections allowed by ASME B31.9 "Building Services Piping" is not exceeded.

L. Insulated Piping: Comply with the following installation requirements.

1. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

2. Saddles: Install protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.

B. Grouting: Place grout under supports for equipment and make a smooth bearing surface.

3.3 METAL FABRICATION

A. Cut, drill, and fit miscellaneous metal fabrications for pipe and equipment supports.

B. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for manual shielded metal-arc welding, appearance and quality of welds, methods used in correcting welding work, and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. Finish welds at exposed connections so that no roughness shows after finishing, and so that contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.5 PAINTING

A. Touching Up: Clean field welds and abraded areas of shop paint and paint exposed areas immediately after erection of hangers and supports. Use same materials as used for shop

painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTMA 780.

END OF SECTION 230529

SECTION 230593

TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections:

1. General requirements for testing agencies are specified in the Division-1 Section Quality Control Services.

2. Other Division 23 Sections specify balancing devices and their installation, and materials and installations of mechanical systems.

1.2 SUMMARY

A. This Section specifies the requirements and procedures total mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

B. Test, adjust, and balance the following mechanical systems:

1. Supply air systems, all pressure ranges;

2. Return air systems;

3. Exhaust air systems;

4. Verify temperature control system operation.

C. This Section does not include:

1. Specifications for materials for patching mechanical systems;

2. Specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, refer to the respective system sections for materials and installation requirements.

3. Requirements and procedures for piping and ductwork systems leakage tests.

1.3 DEFINITIONS

A. Systems testing, adjusting, and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:

1. The balance of air.

2. Adjustment of total system to provide design quantities;

3. Electrical measurement;

4. Verification of performance of all equipment and automatic controls;

5. Test: To determine quantitative performance of equipment.

6. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling).

7. Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.
8. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.

9. Report forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.

10. Terminal: The point where the controlled fluid enters or leaves the distribution system. These are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return inlets on air terminals such as registers, grilles, diffusers, louvers, and hoods.

11. Main: Duct or pipe containing the system's major or entire fluid flow.

12. Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.

13. Branch main: Duct or pipe serving two or more terminals.

14. Branch: Duct or pipe serving a single terminal.

1.4 SUBMITTALS

A. Agency Data:

1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below.

B. Engineer and Technicians Data:

1. Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures meet the qualifications specified below.

C. Procedures and Agenda: Submit a synopsis of the testing, adjusting, and balancing procedures

and agenda proposed to be used for this project.

D. Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 1.

E. Sample Forms: Submit sample forms, if other than those standard forms prepared by the AABC are proposed.

F. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Agency. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below:

G. Draft reports: Upon completion of testing, adjusting, and balancing procedures, prepare draft reports on the approved forms. Draft reports may be handwritten, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports. Submit 2 complete sets of draft reports. Only 1 complete set of draft reports will be returned.

H. Final Report: Upon verification and approval of draft reports, prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final reports.

I. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:

1. General Information and Summary

2. Air Systems

3. Temperature Control Systems

4. Special Systems

J. Report Contents: Provide the following minimum information, forms and data:

1. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses and contact names and telephone numbers. Also include a certification sheet containing the seal and name address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.

2. The remainder of the report shall contain the appropriate forms containing as a minimum the

information indicated on the standard report forms prepared by the AABC, for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.

K. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.5 QUALITY ASSURANCE

A. Agency Qualifications:

1. Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

2. An independent testing, adjusting, and balancing agency certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project, and having at least one Professional Engineer registered in the State in which the services are to be performed, certified by AABC as a Test and Balance Engineer.

B. Codes and Standards:

1. AABC: “National Standards For Total System Balance".

2. ASHRAE: ASHRAE Handbook, 2007 Applications Volume, Chapter 37, Testing, Adjusting, and Balancing.

C. Pre-Balancing Conference: Prior to beginning of the testing, adjusting, and balancing procedures, schedule and conduct a conference with the Architect/Engineer and representatives of installers of the mechanical systems. The objective of the conference is final coordination and verification of system operation and readiness for testing, adjusting, and balancing.

1.6 PROJECT CONDITIONS

A. Systems Operation: Systems shall be fully operational prior to beginning procedures.

1.7 SEQUENCING AND SCHEDULING:

A. Test, adjust, and balance the air systems refrigerant systems.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

2.1 PRELIMINARY PROCEDURES FOR AIR SYSTEM BALANCING:

A. Before operating the system, perform these steps:

1. Obtain design drawings and specifications and become thoroughly acquainted with the design intent.

2. Obtain copies of approved shop drawings of all air handling equipment, outlets (supply, return, and exhaust) and temperature control diagrams.

3. Compare design to installed equipment and field installations.

4. Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.

5. Check filters for cleanliness.

6. Check dampers (both volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans.

7. Prepare report test sheets for both fans and outlets. Obtain manufacturer's outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a crosscheck with required fan volumes.

8. Determine best locations in main and branch ductwork for most accurate duct traverses.

9. Place outlet dampers in the full open position.

10. Prepare schematic diagrams of system "as-built" ductwork and piping layouts to facilitate reporting.

11. Lubricate all motors and bearings.

12. Check fan belt tension.

13. Check fan rotation.

2.2 MEASUREMENTS:

A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.

B. Provide instruments meeting the specifications of the referenced standards.

C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.

D. Apply instrument as recommended by the manufacturer.

E. Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.

F. When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.

G. Take all reading with the eye at the level of the indicated value to prevent parallax.

H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.

I. Take measurements in the system where best suited to the task.

2.3 PERFORMING TESTING, ADJUSTING, AND BALANCING:

A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.

B. Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.

C. Patch insulation, ductwork, and housings, using materials identical to those removed.

D. Seal ducts and piping and test for and repair leaks.

E. Seal insulation to re-establish integrity of the vapor barrier.

F. Mark equipment settings, including damper control positions, valve indicators, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

G. Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

2.4 RECORD AND REPORT DATA:

A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms.

B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

END OF SECTION 230593

SECTION 230900

INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED SECTIONS

A. The General Conditions of the Contract, Supplementary Conditions, and General Requirements are a part of these Specifications and shall be used in conjunction with this Section as a part of the Contract Documents. Consult them for further instructions pertaining to this work. The Contractor is bound by the provisions of Division 1.

1.2 DESCRIPTION

A. General: The control system shall be as indicated on the drawings and described in the specifications for energy management system.

1.3 SUBMITTALS

A. Contractor shall provide shop drawings and manufacturer's standard specification data sheets on all hardware and software to be provided.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Tridium

B. Alerton

C. Automated Logic

D. Distech

2.2 CONTROLLERS

A. Temperature Space Sensors

1. Provide with space temperature adjustment for controls indicated and matching selected Energy Management System.

PART 3 - EXECUTION

3.1 SEQUENCE OF CONTROLS
Refer to plans for sequence of controls requirements

A. Provide sensors, air handler controllers and programming per sequence of controls drawings.

B. Provide front end web based controller that is expandable to entire building in main IT room.

C. Controllers shall be provided as stand-alone controls for weekend change-over of systems to maintain air conditioning in spaces during normal operating hours. Energy management system integration may be completed after HVAC systems have been installed and are operating.

3.2 EXAMINATION

A. The project plans shall be thoroughly examined for control device and equipment locations, and any discrepancies, conflicts, or omissions shall be reported to the Architect/Engineer for resolution as soon as possible.

3.3 GENERAL WORKMANSHIP

A. Install equipment, piping, wiring/conduit parallel to building lines (i.e. horizontal, vertical, and parallel to walls) wherever possible.

B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

C. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

3.4 WIRING

A. All temperature control wiring shall comply with the national and local electrical codes.

B. All wiring in mechanical equipment rooms shall be in EMT.

C. Low voltage wiring (24 volts and below) can be plenum rated cable.

D. Division 26 shall provide power wiring for all temperature controls (whether indicated on the drawings or not).

3.5 INSTALLATION OF SENSORS

A. Install sensors in accordance with the manufacturer's recommendations and per plans.

END OF SECTION 230900

SECTION 232300

REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Requirements of the following Division 23 Sections apply to this section:

1. COMMON WORK RESULTS FOR HVAC

2. HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.2 SUMMARY

A. This Section includes refrigerant piping used for air conditioning applications. This Section includes:

1. Pipes, tubing, fittings, and specialties.

2. Special duty valves.

3. Refrigerants.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Division 2 Specifications for trenching and backfilling for installation of underground refrigerant piping.

C. Products installed but not furnished under this Section include pre-charged tubing, refrigerant specialties, and refrigerant accessories furnished as an integral part of or separately with packaged air conditioning equipment.

1.3 SUBMITTALS

A. Product data for the following products:

1. Each type of valve specified.

2. Each type of refrigerant piping specialty specified.

B. Maintenance data for refrigerant valves and piping specialties, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 23 Section "COMMON WORK RESULTS FOR HVAC."

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with provisions of the following codes:

1. ANSI B31.5: ASME Code for Pressure Piping - Refrigerant Piping.

2. ANSI/ASHRAE Standard 15: Safety Code for Mechanical Refrigeration.

3. SSBCI: Standard Mechanical Code, latest edition.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

B. Refrigerant Valves and Specialties:

1. Alco Controls Div, Emerson Electric.

2. Henry Valve Company.

3. Parker-Hannifin Corporation, Refrigeration and Air Conditioning Division.

4. Sporlan Valve Company.

2.2 PIPE AND TUBING MATERIALS

A. Copper Tubing: ASTM B 280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

B. Copper Tubing: ASTM B 88, Type K and L hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing.

2.3 FITTINGS

A. Wrought-Copper Fittings: ANSI B16.22, streamlined pattern.

2.4 JOINING MATERIALS

A. Brazing Filler Metals: AWS A5.8, Classification BAg-1 (Silver).

2.5 VALVES

A. General: Complete valve assembly shall be UL-listed and designed to conform to ARI 760.

B. Globe: 450 psig (3110 kPa) maximum operating pressure, 275 deg F (135 deg C) maximum operating temperature; cast bronze body, with cast bronze or forged brass wing cap and bolted bonnet; replaceable resilient seat disc; plated steel stem. Valve shall be capable of being repacked under pressure. Valve shall be straight through or angle pattern, with solder-end connections.

C. Check Valves - Smaller Than 3/4 inch (DN 20): 500 psig (3450 kPa) maximum operating pressure, 300 deg F (149 deg C) maximum operating temperature; cast brass body, with removable piston, Teflon seat, and stainless-steel spring; straight through globe design. Valve shall be straight through pattern, with solder-end connections.

D. Check Valves - 3/4 inch (DN 20) and Larger: 450 psig (3110 kPa) maximum operating pressure, 300 deg F (149 deg C) maximum operating temperature; cast bronze body, with cast bronze or forged brass bolted bonnet; floating piston with mechanically retained Teflon seat disc. Valve shall be straight through or angle pattern, with solder-end connections.

E. Solenoid Valves: 250 deg F (121 deg C) temperature rating, 400 psig (2760 kPa) working pressure; forged brass, with Teflon valve seat, two-way straight through pattern, and solder end connections. Provide manual operator to open valve. Furnish complete with NEMA 1 solenoid enclosure with 1/2-inch (16 GRC) conduit adapter, and 24-volt, 60 Hz. normally closed holding coil.

F. Evaporator Pressure Regulating Valves: Pilot-operated, forged brass or cast bronze; complete with pilot operator, stainless steel bottom spring, pressure gage tappings, 24 volts DC, 50/60 Hz, standard coil; and wrought copper fittings for solder end connections.

G. Thermal Expansion Valves: Thermostatic adjustable, modulating type; size as required for specific evaporator requirements, and factory set for proper evaporator superheat requirements. Valves shall have copper fittings for solder end connections; complete with sensing bulb, a distributor having a side connection for hot gas bypass line, and an external equalizer line.

H. Hot Gas Bypass Valve: Adjustable type, sized to provide capacity reduction beyond the last step of compressor unloading; and wrought copper fittings for solder end connections.

## 2.6 REFRIGERANT PIPING SPECIALTIES

A. General: Complete refrigerant piping specialty assembly shall be UL-listed and designed to conform to ARI 760.

B. Strainers: 500 psig (3450 kPa) maximum working pressure; forged brass body with monel 80-mesh (0.18 mm) screen, and screwed cleanout plug; Y-pattern, with solder end connections.

C. Moisture/liquid Indicators: 500 psig (3450 kPa) maximum operation pressure, 200 deg F (93 deg C) maximum operating temperature; forged brass body, with replaceable polished optical viewing window, and solder end connections.

D. Filter-driers: 500 psig (3450 kPa) maximum operation pressure; steel shell, flange ring, and spring, ductile iron cover plate with steel capscrews, and wrought copper fittings for solder end connections. Furnish complete with replaceable filter-drier core kit, including gaskets with

standard capacity desiccant sieves to provide micronic filtration.

2.7 REFRIGERANT

A. Refrigerant No. 410A or R434B, in accordance with ASHRAE Standard 34.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine rough-in for refrigerant piping systems to verify actual locations of piping connections prior to installation.

3.2 PIPE APPLICATIONS

A. Use Type L or Type ACR drawn copper tubing with wrought copper fittings and brazed joints above ground, within building. Use Type K annealed temper copper tubing for 2 inches (DN 50) and smaller without joints, below ground and within slabs. Mechanical fittings (crimp or flair) are not permitted.

1. Install annealed temper tubing in schedule 40 PVC pipe duct. Vent pipe duct to the outside.

B. If other than Type ACR tubing is used, clean and protect inside of tubing as specified in Article "CLEANING" below.

C. All refrigerant piping shall be rated for pressure exerted onto it by the refrigerant type used.

3.3 PIPING INSTALLATIONS

A. General: Install refrigerant piping in accordance with ASHRAE Standard 15 - "The Safety Code for Mechanical Refrigeration."

B. Install piping in as short and direct arrangement as possible to minimize pressure drop.

C. Install piping for minimum number of joints using as few elbows and other fittings as possible.

D. Arrange piping to allow normal inspection and servicing of compressor and other equipment. Install valves and specialties in accessible locations to allow for servicing and inspection.

E. Provide adequate clearance between pipe and adjacent walls and hanger, or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full thickness insulation.

F. Insulate suction lines. Liquid line are not required to be insulated, except where they are installed adjacent and clamped to suction lines, where both liquid and suction lines shall be insulated as a unit.

1. Do not install insulation until system testing has been completed and all leaks have been

eliminated.

G. Install branch tie-in lines to parallel compressors equal length and pipe identically and symmetrically.

H. Install copper tubing in rigid or flexible conduit in locations where copper tubing will be exposed to mechanical injury.

I. Slope refrigerant piping as follows:

1. Install horizontal hot gas discharge piping with 1/2 inch per 10 feet (1:240) downward slope away from the compressor.

2. Install horizontal suction lines with 1/2 inch per 10 feet (1:240) downward slope to the compressor, with no long traps or dead ends which may cause oil to separate from the suction gas and return to the compressor in damaging slugs.

3. Install traps and double risers where indicated and where required to entrain oil in vertical runs.

4. Liquid lines may be install level.

J. Use fittings for all changes in direction and all branch connections.

K. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

L. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

M. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

N. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Provide space to permit insulation applications, with 1-inch (25-mm) clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.

O. Locate groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

P. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inches (DN 150) shall be steel; pipe sleeves 6 inches (DN 150) and larger shall be sheet metal.

Q. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity.

R. Make reductions in pipe sizes using eccentric reducer fittings installed with the level side down.

S. Install strainers immediately ahead of each expansion valve, solenoid valve, hot gas bypass valve, compressor suction valve, and as required to protect refrigerant piping system components.

T. Install moisture/liquid indicators in liquid lines between filter/driers and thermostatic expansion valves and in liquid line to receiver.

1. Install moisture/liquid indicators in lines larger than 2 inches OD (DN 50), using a bypass line.

U. Install unions to allow removal of solenoid valves, pressure regulating valves, expansion valves, and at connections to evaporators.

## 3.4 HANGERS AND SUPPORTS

A. General: Hanger, supports, and anchors are specified in Division 23 Section "Hangers and Supports." Conform to the table below for maximum spacing of supports:

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping.

C. Install hangers with the following minimum rod sizes and maximum spacing:

| Nom. Pipe Size-Inches | Max. Span-Ft. | Min. Rod Size-Inches |
|---|---|---|
| 1 | 7 | 3/8 |
| 1-1/2 | 9 | 3/8 |
| 2 | 10 | 3/8 |

D. Support vertical runs at each floor.

## 3.5 PIPE JOINT CONSTRUCTION

A. Brazed Joints: Comply with the procedures contained in the AWS "Brazing Manual."

1. WARNING: Some filler metals contain compounds which produce highly toxic fumes when heated. Avoid breathing fumes. Provide adequate ventilation.

2. CAUTION: When solenoid valves are being installed, remove the coil to prevent damage. When sight glasses are being installed, remove the glass. Remove stems, seats, and packing of valves, and accessible internal parts of refrigerant specialties before brazing. Do not apply heat near the bulb of the expansion valve.

B. Fill the pipe and fittings during brazing, with an inert gas (ie. nitrogen or carbon dioxide) to prevent formation of scale.

C. Heat joints using oxy-acetylene torch. Heat to proper and uniform brazing temperature.

## 3.6 VALVE INSTALLATIONS

A. General: Install refrigerant valves where indicated, and in accordance with manufacturer's instructions.

B. Install globe valves on each side of strainers and driers, in liquid and suction lines at evaporators, and elsewhere as indicated.

C. Install a full sized, 3-valve bypass around each drier.

D. Install solenoid valves ahead of each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at the top.

1. Electrical wiring for solenoid valves is specified in Division 26. Coordinate electrical requirements and connections.

E. Thermostatic expansion valves may be mounted in any position, as close as possible to the evaporator.

1. Where refrigerant distributors are used, mount the distributor directly on the expansion valve outlet.

2. Install the valve in such a location so that the diaphragm case is warmer than the bulb.

3. Secure the bulb to a clean, straight, horizontal section of the suction line using two bulb straps. Do not mount bulb in a trap or at the bottom of the line.

4. Where external equalizer lines are required make the connection where it will clearly reflect the pressure existing in the suction line at the bulb location.

F. Install pressure regulating and relieving valves as required by ASHRAE Standard 15.

## 3.7 EQUIPMENT CONNECTIONS

A. The Drawings indicate the general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow servicing and maintenance.

## 3.8 FIELD QUALITY CONTROL

A. Inspect, test, and perform corrective action of refrigerant piping in accordance with ASME Code B31.5, Chapter VI.

B. Repair leaking joints using new materials and retest for leaks.

## 3.9 CLEANING

A. Before installation of copper tubing other than Type ACR tubing, clean the tubing and fitting using following cleaning procedure:

1. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through the tubing by means of a wire or an electrician's tape.

2. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.

3. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.

4. Finally, draw a clean, dry, lintless cloth through the tube or pipe.

3.10 ADJUSTING AND CLEANING

A. Verify actual evaporator applications and operating conditions and adjust thermostatic expansion valve to obtain proper evaporator superheat requirements.

B. Adjust controls and safeties. Replace damaged or malfunctioning controls and equipment with new materials and products.

3.11 COMMISSIONING

A. Charge system using the following procedure:

1. Install core in filter dryer after leak test but before evacuation.

2. Evacuate refrigerant system with vacuum pump; until temperature of 35 deg F (1.7 deg C) indicated on vacuum dehydration indicator.

3. During evacuation, apply heat to pockets, elbows, and low spots in piping.

4. Maintain vacuum on system for minimum of 5 hours after closing valve between vacuum pump and system.

5. Break vacuum with refrigerant gas, allow pressure to build up to 2 psi (13.8 kPa).

6. Complete charging of system, using new filter dryer core in charging line. Provide full operating charge.

B. Train Owner's maintenance personnel on procedures and schedules related to start-up and shut-down, troubleshooting, servicing, and preventative maintenance of refrigerant piping valves and refrigerant piping specialties.

C. Review data in Operating and Maintenance Manuals. Refer to Division 1 Specifications.

D. Schedule training with the Owner through the Architect, with at least 7 days advance notice.

END OF SECTION 232300

SECTION 23313

METAL DUCTWORK FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Requirements of the following Division 23 Sections apply to this section:

1. "COMMON WORK RESULTS FOR HVAC"

1.2 SUMMARY

A. This Section includes rectangular and round metal ducts and plenums for heating, ventilating, and air conditioning systems in pressure classes from minus 1 inches to plus 1 inches water gage.

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

1. Division 23 Section "INSTRUMENT AND CONTROL FOR HVAC" for automatic volume control dampers and operators.

2. Division 23 Section "TESTING, ADJUSTING AND BALANCING FOR HVAC."

1.3 DEFINITIONS

A. Sealing Requirements Definitions: For the purposes of duct systems sealing requirements specified in this Section, the following definitions apply:

1. Seams: A seam is defined as joining of two longitudinally (in the direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on the perimeter are deemed to be joints.

2. Joints: Joints include girth joints; branch and sub-branch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum, and casing abutments to building structures.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. The duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of the air system. Changes or alterations to the layout or configuration of the duct system must be specifically approved in writing. Accompany requests for layout modifications with calculations showing that the proposed layout will provide the original design results without increasing the system total pressure.

1.5 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data including details of construction relative to materials, dimensions of individual components, profiles, and finishes for the following items:

1. Sealing Materials.

2. Fire-Stopping Materials.

C. Record drawings including duct systems routing, fittings details, reinforcing, support, and installed accessories and devices, in accordance with Division 23 Section "COMMON WORK RESULTS FOR HVAC" and Division 1.

D. Maintenance data for volume control devices and fire dampers in accordance with Division 23Section "COMMON WORK RESULTS FOR HVAC" and Division 1.

1.6 QUALITY ASSURANCE

A. NFPA Compliance: Comply with the following NFPA Standards:

1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

B. FBC: 2023 Florida Building Code, Mechanical

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver sealant and fire-stopping materials to site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle sealant fire-stopping materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

C. Deliver and store stainless steel sheets with mill-applied adhesive protective paper, maintained through fabrication and installation.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

A. Sheet Metal, General: Provide sheet metal in thicknesses indicated, packaged and marked as specified in ASTM A 700.

B. Galvanized Sheet Steel: Lock-forming quality, ASTM A 527, Coating Designation G 90. Provide

mill phosphatized finish for exposed surfaces of ducts exposed to view.

C. Stainless Steel: ASTM A 480, Type 316, sheet form, with No. 4 finish on exposed surface for ducts exposed to view; Type 304, sheet form, with No. 1 finish for concealed ducts.

D. Aluminum Sheets: ASTM B 209, Alloy 3003, Temper H14, sheet form; with standard, one-side bright finish where ducts are exposed to view, and mill finish for concealed ducts.

E. Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum and stainless steel ducts provide reinforcing of compatible materials.

F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 SEALING MATERIALS

A. Joint and Seam Sealants, General: The term sealant used here is not limited to materials of adhesive or mastic nature, but also includes tapes and combinations of open weave fabric strips and mastics.

B. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with the tape to form a hard, durable, airtight seal.

C. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.

D. Flanged Joint Mastics: One-part, acid-curing, silicone elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

2.3 FIRE-STOPPING

A. Fire-Resistant Sealant: Provide one-part elastomeric sealant formulated for use in a through-penetration fire-stop system for filling openings around duct penetrations through walls and floors, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

B. Products: Subject to compliance with requirements, provide one of the following:

1. "Dow Corning Fire Stop Sealant", Dow Corning Corp.

2. "3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M.

3. "RTV 7403"; General Electric Co.

4. "Fyre Putty"; Standard Oil Engineered Materials Co.

## 2.4 HANGERS AND SUPPORTS

A. Building Attachments: Concrete inserts or structural steel fasteners appropriate for building materials.

B. Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.

1. Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards (latest Edition), for sheet steel width and gage and steel rod diameters.

C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

D. Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.

1. Where galvanized steel ducts are installed, provide hot-dipped-galvanized steel shapes and plates.

2. For stainless steel ducts, provide stainless steel support materials.

3. For aluminum ducts, provide aluminum support materials, except where materials are electrolytically separated from ductwork.

## 2.5 DUCT FABRICATION

A. General: Except as otherwise indicated, fabricate ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," including associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.

1. Fabricate ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.

2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.

B. Fabricate fume hood exhaust ducts with stainless steel. Weld and flange seams and joints. Conform to NFPA Standard 96.

C. Static Pressure Classifications: Except where otherwise indicated, construct duct systems to the following pressure classifications:

1. Supply Ducts: 1 inches water gage.

2. Return Ducts: 1 inches water gage, negative pressure.

3. Exhaust Ducts: 1 inches water gage, negative pressure.

D. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and

are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are externally insulated.

E. Fabricate supply air duct with internal duct liner for sound attenuation where indicated on plans. Liner shall be by Schuller,Permacote Linecoustic R-300. The Permacote surface coating is specially formulated with an EPA - registered anti-microbial agent so it will not support the growth of fungus or bacteria, as determined by tests in accordance with ASTM C 1071 and ASTM G21 and G22.

2.6 DUCT FITTINGS

A. Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard" (latest Edition).

PART 3 - EXECUTION

3.1 DUCT INSTALLATION, GENERAL

A. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.

B. Install ducts with the fewest possible joints.

C. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.

D. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.

E. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.

H. Install insulated ducts with 1-inch clearance outside of insulation.

I. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.

J. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

K. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

L. Non-Fire-Rated Partition Penetrations: Where ducts pass interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2 inches.

M. All turns in ductwork shall have mitered inside corners.

3.2 SEAM AND JOINT SEALING

A. General: Seal transverse duct joints.

B. Seal externally insulated ducts prior to insulation installation.

3.3 HANGING AND SUPPORTING

A. Install rigid round and rectangular metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.

B. Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.

C. Support vertical ducts at each floor.

D. Upper attachments to structures shall have an allowable load not exceeding 1/4 of the failure (proof test) load but are not limited to the specific methods indicated.

E. Install concrete insert prior to placing concrete.

3.4 C ONNECTIONS

A. Equipment Connections: Connect equipment with flexible connectors in accordance with Division 23 15 Section "Duct Accessories."

B. Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.

C. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.

3.5 LOUVERS:

A. General: Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

B. Performance: Provide louvers that have minimum free area, and maximum pressure drop of each type as listed in manufacturer's current data, complying with louver schedule.

C. Substrate Compatibility: Provide louvers with frame and sill styles that are compatible with

adjacent substrate, and that are specifically manufactured to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to general construction drawings and specifications for types of substrate which will contain each type of louver.

D. Materials: Construct of aluminum extrusions, ASTM B 221, Alloy 6063-T52. Weld units or use stainless steel fasteners. Provide louvers in anodized finish in colors to be selected by Architect from manufacturer's standard color selection chart.

E. Louver Screens: On outside face of exterior louvers, provide mesh anodized aluminum wire bird and insect screens mounted in removable extruded aluminum frames.

F. Manufacturer: Subject to compliance with requirements, provide louvers of one of the following:

1. Ruskin Mfg. Co.

2. Pottorff

3. Greenheck

## 3.6 FIELD QUALITY CONTROL

A. Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.

## 3.7 ADJUSTING AND CLEANING

A. Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 23 Section "TESTING, ADJUSTING, AND BALANCING FOR HVAC" for requirements and procedures for adjusting and balancing air systems.

B. Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION 23313

SECTION 238126

SPLIT SYSTEM AIR CONDITIONING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Requirements of the following Division 23 Sections apply to this section:

1. “COMMON WORK RESULTS FOR HVAC.”

1.2 SUMMARY

A. This Section includes requirement for a constant volume, central station air handler unit with supply fan, cooling coils, and heating coils.

B. Related Sections: The following Sections contain requirements that relate to this section:

1. Division 23 15 “INSTRUMENTATION AND CONTROL FOR HVAC.”

C. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, weights (shipping, installed, and operating), dimensions, required clearances, and methods of assembly of components, furnished specialties and accessories; and installation and start-up instructions.

D. Wiring Diagrams: Submit ladder-type wiring diagrams for power and control wiring required for final installation of condensing units and controls. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.

E. Operation and Maintenance Data: Submit maintenance data and parts list for each condensing unit, control, and accessory; including "trouble shooting" maintenance guide; plus servicing, and preventative maintenance procedures and schedule. Include this data and product data in maintenance manual; in accordance with requirements of Division 1.

1.3 QUALITY ASSURANCE:

A. Codes and Standards:

1. Units energy efficiencies shall meet or exceed the requirements of ASHRAE 90.1.

2. Capacity ratings packaged compressor and condenser units shall be in accordance with ARI Standards 210 or 360 as applicable to size.

3. Unit sound levels shall be in accordance with ARI sound standards 270 and 360.

4. Unit design shall conform to ASHRAE Standard 15.

5. Units shall be UL tested and certified in accordance with ANSI Z21.47 as a total package.

6. NFPA Compliance: Fan coil units and components shall be designed, fabricated, and installed in compliance with NFPA Standard 90A "Standard for the Installation of Air Conditioning and Ventilating Systems."

1.4 DELIVERY, STORAGE, AND HANDLING:

A. Handle units and components carefully to prevent damage. Follow manufacturer's written instructions for rigging. Replace damaged units or components.

B. Store units and components in clean dry place off the ground. Protect from weather, water, and physical damage.

1.5 SPECIAL PROJECT WARRANTY:

A. Warranty on Motor/Compressor and Heater: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, motors/compressors and heater with inadequate or defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. Replacement is limited to component replacement only and does not include labor for removal and reinstallation.

1. Warranty Period: 5 years from date of substantial completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver units as a factory assembled unit to the extent allowable by shipping limitations, with protective crating and covering.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate the size and location of equipment pads.

1.8 EXTRA MATERIALS

A. Furnish one additional complete set of filters and fan belts for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. General Description: Unitary air handlers for ventilation, heating, cooling, filtration and distribution. Unit shall be assembled for draw-thru application and shall be arranged to discharge conditioned air horizontally or vertically as shown on the contract drawings. Unit shall be provided with direct-expansion cooling coil(s), heating coil(s) as may be required. Unit shall

have the capability to be used in a refrigerant circuit in conjunction with air-cooled condensing units.

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

1. Lennox

2. Carrier Air Conditioning: Div of Carrier Corp.

3. Trane, Business of American Standard Companies.

2.2 CABINET

A. Materials: Formed and reinforced galvanized steel panels (20 gauge minimum), fabricated to allow removal for access to internal parts and components. Externally exposed surfaces to be painted with baked enamel finish. Internal parts shall be constructed of heavy gauge galvanized steel. Interior surfaces shall have a finish that is capable of inhibiting microbial and fungal growth.

B. Interior surfaces of the cabinet shall be insulated with 3/4-inch minimum thickness 1 lb minimum density flexible fiberglass insulation with neoprene coating on the air side of the insulation. Insulation to comply with NFPA Standard 90A. Insulation paint shall be capable of inhibiting microbial and fungal growth.

C. Access Panels and Doors: Same materials and finishes as cabinet and complete with gaskets.

D. Drain Pans: Formed sections of plastic, galvanized steel, or stainless steel. Fabricate pans in sizes and shapes to collect condensate from cooling coils.

E. Unit shall have standard single point power wiring capability.

F. Cabinet shall field convertible to permit for horizontal or vertical supply air and return air flow.

2.3 EVAPORATOR FANS AND FAN DRIVES

A. Fan Section: Fan section shall be equipped with a formed heavy gauge steel channel base for integral mounting of fan, motor, and casing panels. Fan and fan drive assembly shall slide out for easy access.

B. Fan Construction shall be as follows:

1. Fan shall be a static and dynamically balanced centrifugal type with double-inlet and forward-curved blades. Fan bearings shall be permanent fully-lubricated ball, rubber-isolated cartridge type ball or pillow-block ball bearings.

2. Fan housing and wheel shall be steel with corrosion resistant finish.

3. Fan shaft shall be steel with fan wheel keyed to shaft.

4. Fan shall be belt driven or directly driven as per plans.

C. Belt Fan Drives

1. Fans shall be direct, or belt driven as scheduled own on the drawings. Belt driven fans shall include a fan pulley, belt and adjustable–pitch motor pulley.

2. Fan motors shall be continuous operation, open drip proof with permanently sealed, permanently lubricated ball bearings.

3. Fan belt shall be positioned to prevent damage to evaporator if belt breaks.

4. Fan motor shall be internally mounted with rubber grommets for vibration isolation.

2.4 EXPANSION AND HEATING COILS

A. Expansion Coils:

1. Designed and fabricate coils in compliance with ASHRAE Standard 15.

2. Coils shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubing with separate and independent refrigeration circuit for each compressor associated with the unit.

3. Coils shall be factory pressure tested at 1,875 psig minimum, and leak tested at 150 psig minimum.

4. Coils shall be provided with factory adjusted expansion valves which are externally adjustable.

B. Electric Resistance Coils:

1. Open wire type, nickel-chrome alloy. Elements shall be uniformly distributed over cross sectional area of unit with vertical support brackets to prevent coil element sag. Coil elements shall be insulated with ceramic bushings and supported in an aluminized or galvanized steel frame.

2. Provide assembly with integral fusing for protection of internal heating circuits.

C. Provide hot gas reheat coil and bypass sections as scheduled on the drawings.

2.5 FILTERS SECTION

A. General: Filters shall comply with NFPA Standard 90A "Standard for the Installation of Air Conditioning and Ventilating Systems."

B. Filter Section: Cabinet material and finish shall match the unit cabinet, with filter media holding frames arranged for flat or angled orientation as scheduled on the drawings.

C. Filters pleated 2" thick 25% to 35% efficient per ASHRAE Standard 52 unless otherwise scheduled on the drawings.

D. Filers shall be accessible through a dedicated hinged access panel and, depending on size, be on a slide out track.

2.6 CONTROLS

A. Operating and safety controls shall include high- and low-pressure cutouts, oil pressure cutout, compressor winding thermostat cutout, 3-leg compressor overload protection, and condenser fan motors with thermal and overload cutouts. Control transformer if required shall be 115 or 277 Volts as appropriate for unit Voltage. Provide magnetic contactors for evaporator fan motor and heater. Additional features include:

1. Emergency drain pan float switch for discontinuing unit use if condensate does not drain.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. General: Install units in accordance with manufacturer’s installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

B. Support:

1. Install all equipment using proper vibration isolating assemblies for the application.

3.2 FIELD QUALITY CONTROL:

A. Testing:

1. Charge systems with refrigerant and oil and test for leaks. Repair leaks and replace lost refrigerant and oil.

3.3 DEMONSTRATION:

A. Provide services of manufacturer's authorized service representative to provide start-up service and to instruct Owner's personnel in operation and maintenance of condensing units.

B. Start-up condensing units, in accordance with manufacturer's start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

C. Train Owner's personnel on start-up and shut-down procedures, troubleshooting procedures, servicing, and preventative maintenance schedule and procedures. Review with the Owner's personnel, the data contained in the Operating and Maintenance Manuals specified in Division One.

1. Schedule training with Owner, provide at least 7-day prior notice to Architect/Engineer.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 sections. The following are specific connection requirements:

1. Connect condensate drain pans using PVC piping. Construct trap at connection to drain pan.

B. Duct installations and connections are specified in other Division 23 sections. Make final duct connections with flexible connections.

C. Electrical Connections: The following requirements apply:

1. Electrical power wiring is specified in Division 26.

2. Grounding: Connect unit components to ground in accordance with the National Electrical Code.

3.5 ADJUSTING, CLEANING, AND PROTECTING

A. Clean unit cabinet interiors to remove foreign material and construction dirt and dust.

3.6 COMMISSIONING

A. Final Checks Before Start Up: Perform the following operations and checks before start up:

1. Verify unit is secure on mountings and supporting devices and that connections for piping, ductwork, and electrical are complete.

2. Perform cleaning and adjusting specified in this Section.

3. Set outside air and return air mixing dampers to minimum outside air setting.

4. Install clean filters.

5. Check proper charging of the refrigerant system.

6. Check and adjust belts and pulleys for alignment and belt tension.

B. Starting procedures for units:

1. Energize unit and verify proper operation of evaporator fan, compressor(s), condenser fan(s) cooling and heating controls. Adjust fans to indicated RPM.

C. Refer to Division 23 Section "TESTING, ADJUSTING AND BALANCING FOR HVAC" for procedures for system testing, adjusting, and balancing.

END OF SECTION 238126

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 CONSTRUCTION DRAWINGS

A. The contract drawings indicate the extent and the general conditions of the work. If any departures from the contract drawings are deemed necessary by the sub-contractor, details for such departures and the reasons therefore shall be submitted to the Engineer immediately.

B. These items shall be submitted, in writing, for approval. No such departure shall be made without prior written approval of the Architect and Engineer.

C. The drawings are diagrammatic and indicate the general arrangement of fixtures, equipment and work included in the contract. Consult the architectural drawings and details for exact location of fixtures and equipment.

D. The sub-contractor shall follow the drawings in laying out work and check the drawings of other trades to verify spaces in which work will be installed. Maintain head room and space conditions at all points. Where head room or space conditions appear inadequate, notify the Architect before proceeding with the installation.

E. Likewise, the sub-contractor shall follow the drawings in laying out work and coordinate with the drawings of other trades to verify locations for all equipment on site. Maintain proper clearances from new or existing utilities or structures. The sub-contractor is responsible for coordinating any requirements of local utilities. Where space or clearance conditions appear inadequate, notify the Architect before proceeding with the installation.

F. If directed by the Architect, the sub-contractor shall, without extra charge, make reasonable modifications (as judged by Architect) in the layout and installation of the electrical equipment, fixtures, and devices as needed to prevent conflict with work of other trades (whether on site or within structure); to prevent conflict with new or existing utilities (whether on site or within structure); or for proper execution of the work.

1.2 ORDINANCES AND REGULATIONS

A. If the work as laid out, indicated, or specified is contrary to, or conflicts with codes ordinances or regulations, the sub-contractor shall report same to Architect before submitting his bid. Architect will issue instructions as to procedure.

1.3 PERMITS AND FEES

A. The General Contractor shall insure that the necessary permits and inspections required for his work are obtained. He shall deliver to Architect certificates of inspection issued by authorities having jurisdiction.

1.4 GUARANTEE AND SERVICE

A. In addition to guarantee of equipment by manufacturer of each piece of equipment specified herein, each sub-contractor shall also guarantee such equipment and make good any defect of material or workmanship occurring during a period of (1) year from final acceptance test, without expense to Owner.

B. Each Subcontractor shall service systems for (1) year from final acceptance. Such service will include lubrication, necessary adjustment, and/or replacement of defective equipment and materials furnished. Incandescent light bulb (incandescent only) replacement guarantee shall be limited to 30 days, H.I.D. and fluorescent lamps at 180 days after final acceptance.

1.5 CODES AND INSPECTIONS

A. Work shall comply with:

1. National Electric Code (2020 edition)

2. O.S.H.A. Standards

3. State of Florida ADA Handicap Requirements

4. 2023 State of Florida Building Code.

5. Other Standards so adopted by the Florida Building Code.

1.6 SCOPE

A. Furnish labor, materials, and equipment necessary for a complete and workable system and installation.

1.7 STORAGE OF MATERIALS

A. Prior to and during installation, store materials to protect them from injury or deterioration. Material shall not be stored in contact with ground or floor. If suitable storage areas are not available at job site, provide temporary construction or store material off-site in suitable warehouses. Do not remove manufacturer's packing materials until ready to install.

1.8 ELECTRICAL SERVICE

A. Electrical service and feeders shall be as indicated. Consultation and coordination with applicable Utility Company representative is a sub-contractor job requirement prior to start of project. Coordination shall occur within 7-days of sub-contract award. Advise Architect and Engineer immediately of any changes which will cause an increase of cost to the Owner or other change of scope; without notification within 7 days, no cost increases will be accepted.

1.9 CONTINUITY OF SERVICE

A. Uninterrupted use of existing facility must be continued during the entire time required for the installation of equipment and work required under this contract. This shall be applicable to all electrical systems involved in this contract and shall include: power, lighting, fire alarm, telecommunications, television, etc.

B. Contractor shall perform all work so as to maintain the lowest possible amount of "down time." Connections to existing services or equipment, change of service, or any other work that will require periods of "down time," shall be scheduled and performed after hours so as to prevent "down time."

C. If after-hour work is not acceptable to client/owner, contractor may opt to schedule "down time" with the owner. This "down time" shall be schedule a minimum of 48 hours in advance of the proposed interruption.

1.10 REMOVAL OF EXISTING CIRCUITRY

A. Where existing devices are to be removed during construction (or demolition), all fixtures, conduits, boxes, and wiring (not required to maintain continuity of service) shall be completely removed.

B. Any removed equipment of value shall be given to the owner for storage. Contractor shall otherwise be responsible for disposal of demolished equipment and materials.

1.11 EXISTING BUILDING EQUIPMENT

A. Contractor shall disconnect and remove all existing equipment within an area of renovation, unless specifically required to remain or to maintain continuity of service. If the plans require the installation of a new receptacle, light fixture, or other device in a location where an existing device is installed, the contract may re-use the existing conduit and boxes.

1.12 COORDINATION

A. It shall be the responsibility of the electrical contractor to coordinate the installation details of <u>all</u> electrically operated equipment and devices. This shall include all light fixtures and other devices within structures, on exterior of structures, or on site.

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.

2. To provide for ease of disconnecting the equipment with minimum interference to other installations.

3. To allow right of way for piping and conduit installed at required slope.

4. So connecting raceways and wireways will be clear of obstructions and of the working and access space of other equipment.

B. Contractor is encouraged to match up equipment (along with other trades) in areas expected to be "tight" prior to actual installation to judge fit and make adjustments accordingly.

C. The electrical contractor shall periodically inspect the installations of other trades (HVAC, plumbing, fire protection, etc.) and notify the General Contractor, Architect, and Engineer of any conflicts with electrical systems.

D. Any courses of action taken to accommodate conflicts after-the-fact shall not be considered as “extra services” and will not be subject to additional billings as such.

E. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

F. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."

G. Coordinate sleeve selection and application with selection and application of fire stopping specified in Division 7, “Penetration Firestopping.”

1.13 SUBMITTALS

A. All submittals of electrical materials or equipment shall be made at the same time contained within one binder and one letter of transmittal. Follow the procedures specified in Division 1.

B. See Architectural front end additional requirements for shop drawing procedures.

C. Provide shop drawings in hard copy (book) format for the following:

1. Light fixtures and lamps

2. Switchgear and panelboards / loadcenters

3. Electrical devices (switches, receptacles, cover plates)

4. Any and all Electronics including TVSS (Surge Protection devices)

5. Wire & cable

6. Conduit & fittings

7. All associated systems equipment

8. All devices

D. Corrections or comments made on shop drawings during review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with design concept of project, and general compliance with information given in contract documents.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials and equipment are specified herein by a single or by multiple manufacturers, to indicate quality, material, and type of construction desired. One Manufacturer's product is indicated and has been used as basis for design; it shall be each Subcontractor's responsibility to ascertain that

alternate Manufacturer's products conform to detailed specification, and that size and arrangement of equipment is suitable for installation. Products of other Manufacturer's will be considered for use if in the Engineer's opinion, item requested for substitution is equal to that specified. Should a Subcontractor desire to make a substitution, he should apply in writing, stating amount of credit or extra involved, including complete Engineering data.

B. It shall be the responsibility of each sub-contractor making a substitution to include costs for changes required by other trades for proper operation of equipment proposed to be substituted.

C. Before purchase of equipment, submit shop drawings for approval. Submit as complete as possible. Identify each item submitted. Information on shop drawings shall contain all that is necessary to show that equipment complies with specifications and drawings. Show required modifications. One complete set of approved shop drawings shall be kept at job site.

D. The subcontractor is responsible for providing all incidental materials needed for a complete and working installation. This is in addition to the specific equipment specified in the contract documents.

E. All materials and equipment furnished under this contract shall bear the label of approval of the Underwriters Laboratory, Inc. (UL).

2.2 INSTRUCTIONS

A. Each sub-contractor shall furnish (3) complete sets of operations and maintenance instructions applying to each piece of equipment installed in conjunction with this contract.

PART 3 - EXECUTION

3.1 SUPERVISION

A. Maintain competent Superintendent in charge of work. Superintendent shall be qualified and have suitable experience in type of work involved.

B. Should he be deemed not capable by Architect, he shall be replaced immediately by a Superintendent who is satisfactory. After a satisfactory Superintendent has been assigned, he shall not be withdrawn without consent of Architect.

3.2 WORKMANSHIP

A. Materials and equipment shall be installed in a neat and industry standard manner as judged by the Engineer of Record.

B. Architect reserves right to direct removal and replacement of items which, in his opinion, do not present an orderly and reasonably neat appearance provided such as orderly installation can be made using customary trade methods. The removal and replacement shall be done when directed in writing by Architect at sub-contractor's expense and without additional expense to Owner.

3.3 CONNECTING TO WORK OF OTHERS

A. Before starting his work and from time to time as work progresses, the Electrical sub-contractor's

superintendent shall examine work and materials installed by others insofar as they apply to his own work, and shall notify the Architect immediately in writing of conditions which will prevent satisfactory results from the installation of the system.

B. Should the Electrical subcontractor start his work without proper notification, it shall be construed as an acceptance by him of all conditions and as to suitability of the work of others to receive his work.

3.4 DAMAGE TO OTHER WORK AND PERSONNEL

A. Each sub-contractor shall be responsible for proper protective measures when working overhead or in finished areas. He shall repair, replace, or touch up finished surface which may be damaged as a result of his work or operations. This is to include preparation, priming, and refinish of structure due to welding or machining for attachment of electrical equipment.

B. Subcontractor shall carry suitable insurance as prescribed by law for protection of his employees, other persons, materials and equipment on site.

3.5 CUTTING, PATCHING, AND EXCAVATIONS

A. Cutting and patching of walls, partitions, floors, concrete, pits and chases in wood and masonry will be done by this sub-contractor as indicated or as directed by Architect. Cutting of steel, wood, or other main structural parts must be approved by Architect prior to commencing cutting.

B. Sub-contractor shall do necessary excavation and back-filling for his own work.

3.6 REMOVAL OF RUBBISH

A. Subcontractor shall maintain premises free from accumulations of waste material or rubbish caused by his employees or work. At completion of work, he shall remove tools, scaffolding, materials and rubbish from building site, and leave premises and his work in a clean, orderly, and acceptable condition.

3.7 CLEANING AND ADJUSTMENTS

A. Upon completion of work, each sub-contractor shall clean, oil, and grease fans, motors, and other running equipment and apparatus which he installs, and shall make certain such apparatus and mechanisms are in proper working order and ready for test.

3.8 ACCEPTANCE INSPECTION

A. Contractor shall read applicable sections of these specifications, and prepare and assemble required test reports, maintenance manuals, certificates, guarantees and letters of instruction. Contractor's representatives responsible for work under Division 16 shall be present at time of acceptance inspections, and shall furnish required mechanics, tools, and ladders to assist in inspection.

B. Prior to requesting final inspection, the sub-contractor shall clean, and where required, paint electrical equipment installed. Exposed conduits, exposed outlet boxes, surface panel cabinets, etc. shall be finished to match walls or ceilings. Cabinets, panels, panel covers, scratched or

otherwise damaged, shall be painted with factory supplied color-matched paint. Interiors of panelboards, switchboards and cabinets shall be vacuumed, free of dust and debris.

C. List of items to be corrected as a result of acceptance inspection will be furnished to the Architect for transmittal to the General Contractor.

D. Notify Architect in writing of items appearing on list for correction which are disputed by the sub-contractor. When ready, request in writing a re-inspection of work. Should items on the rejection list remain uncorrected, additional inspections required to ascertain completion shall be paid by Contractor to the Engineer at current billing rates of the Engineer.

3.9 EQUIPMENT CONNECTIONS

A. Provide electrical power and control systems to indicated equipment. Included are wiring, raceways, disconnects, and other devices. Motor starters for mechanical equipment, if not an integral part of the equipment, are the direct responsibility of the electrical sub-contractor to provide, install, and connect as directed by the mechanical sub-contractor. Starter heater sizes, etc. shall be coordinated with the actual equipment installed. Circuit breaker combination type NEMA 1 starters with 120-volt control shall normally be the requirement. Control wiring shown on mechanical drawings shall be provided under this section by the mechanical Contractor if it is a low voltage controls system, however all cabling shall meet the requirements of this division. The electrical Contractor shall coordinate all details of the control wiring for any conduit requirements. Maintain (1) set of approved equipment shop drawings and control system wiring diagrams on the job. Provide rough-in power and control in accordance with this set.

B. Rough-in locations, type of connection (straight blade or twist-lock receptacle, wall junction box with flex conduit to unit, or unit mounted J-box etc.), ampacity of the connections, single or 3-phase circuits required are end responsibility of Electrical Contractor. This applies to such equipment as: water coolers, water heaters, pumps, A/C condensing units, A/C air handlers, vent and exhaust fans, heat strips and unit heaters, and other equipment. Final information must be obtained from the actual "to be installed" equipment drawings; do not order branch circuit breakers until the equipment shop drawings have been reviewed.

END OF SECTION 260500

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes specifications for the following:

B. Building wires and conductors rated 600 Volts and less.

C. Connectors, splices, and terminations rated 600 Volts and less.

1.2 QUALITY ASSURANCE

A. All cables and conductors shall be listed for the environments in which they are to be installed.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For testing agency.

C. Field quality control test reports.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 GENERAL

A. Conductors shall be copper (unless noted otherwise on plans). Conductor insulation type shall THHN/THWN or XHHW. All conductor ampacities are to be based upon 75 degree C (Centigrade) insulation. No down-sizing is permitted of conductor size based upon use of 90 degree C rated insulation.

B. Conductors sizes number 10 and smaller are to be solid Copper. Larger sizes are permitted to be stranded.

2.2 MANUFACTURERS

A. Connectors and Splices: Subject to compliance with requirements, provide products by:

1. Ideal Industries
2. 3M, Electrical Products Division
3. Hubbell
4. Pass and Seymour

B. Conductors: Subject to compliance with requirements, provide products by:

1. American Insulated Wire Corp.
2. General Cable Corporation
3. Southwire Company

PART 3 - EXECUTION

3.1 INSTALLATION

A. Branch circuit outlets shall be connected as indicated.

B. The continuity of neutrals of branch circuits shall not be made on the terminals of any device. Instead, the neutral shall be spliced and tap connected to device. This will assure no opening of neutral in replacement of device.

C. Fixture and branch circuit wiring joints for conductors No. 6 AWG and smaller in junction and outlet boxes shall be made with U.L. approved pressure-type connectors. Use Ideal Industries Models 451, 452, or 454 and Scotch-Lock types Y, R, or B. Splices and taps for conductors No. 4 AWG and larger shall be made using 2 bolt type solder-less connectors made of high conductivity bronze castings, taped with at least 3 layers of insulating tape, half-lapped. No spring or wedge type “push-in” connections are permitted.

D. All fixture terminations shall be made by means of clamp type connectors using screws or bolts to apply pressure. No spring or wedge type “push-in” connections are permitted. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. See section “IDENTIFICATION FOR ELECTRICAL SYSTEMS” for coloring and marking of cabling.

F. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

## 3.2 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

END OF SECTION 260519

SECTION 260533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes specifications and requirements for electrical raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 GENERAL

A. Raceway locations shown are diagrammatic. Runs are to be governed by structural conditions. Install raceways concealed unless specifically noted. Cap conduits immediately after installation to prevent entrance of foreign matter. Run concealed raceways with minimum bends in shortest practical distance. Bends and off- sets shall be of code radius. 360 degrees total accumulation of bends in a single run is the maximum allowed. Run exposed conduit parallel and perpendicular to surface or exposed structural members. Follow surface contours as much as practical to provide a neat appearance.

B. These specifications apply to all conduits for all systems on the project, including telephone, CATV, security, fire alarm, etc.

1.3 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.

1. Custom enclosures and cabinets.

2. For handholes and boxes for underground wiring, including the following:

a. Duct entry provisions, including locations and duct sizes.

b. Frame and cover design.

c. Grounding details.

d. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

e. Joint details.

C. Source quality-control test reports.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories are to be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Conduits shall be by one of the following:

1. Pittsburgh Standard
2. Youngstown
3. Republic
4. Wheatland
5. Allied Tube
6. Carlon

B. Boxes shall be by one of the following:

1. Thomas & Betts (T&B)
2. RACO
3. Carlon
4. O-Z

C. Fittings shall be by one of the following:

1. T&B
2. Hubbell
3. Allied Tube
4. Caddy
5. RACO
6. Carlon

7. O-Z

D. Other manufacturers may be used subject to prior approval.

2.2 CONDUIT

A. EMT

1. Electrical metallic tubing (EMT) shall be galvanized steel. Aluminum is not permitted.

   Use of EMT larger than 4" is not permitted. Do not install EMT in concrete and other areas where rigid conduit is specified.

2. All EMT box connectors shall be insulated throat type.

3. All fittings shall be compression type.

4. ANSI C80.3.

B. FMC

1. Flexible Metal Conduit (FMC) shall be of Zinc coated steel construction. Aluminum is not permitted.

2. All FMC box connectors shall be insulated throat type.

3. 3/8" aluminum Greenfield for fixture "pigtails" and 1/2" aluminum Greenfield for small motor (1 horse power or less) connections are acceptable.

C. LFMC

1. Liquidtight Flexible Metal Conduit (LFMC) shall be of steel construction. Aluminum is not permitted.

2. All LFMC box connectors shall be insulated throat type.

D. LFNC

1. Liquidtight Flexible Nonmetallic Conduit (LFNC) shall be Type B of PVC construction.

2. Conduit shall have smooth interior walls.

3. All LFNC box connectors shall be insulated throat type.

E. RMC

1. Rigid Metallic Conduit (RMC) shall be of hot-dipped galvanized construction. Aluminum is not permitted.

2. All RMC box connectors to be threaded with insulated throats.

3. All threaded fittings are to have joint compound applied prior to installation. Compound to be listed for use in electrical installations to lubricate and protect joint from corrosion and enhance electrical conductivity.

F. RNC

1. Rigid Nonmetallic Conduit (RNC) shall be Schedule 40 or 80 PVC, NEMA TC 2.

2. Fittings are to be NEMA TC 3 and shall match conduit type and material.

2.3 JUNCTION BOXES

A. Provide junction boxes in quantities, locations, and sizes as required by installation or code.

B. All interior boxes shall be of galvanized steel construction. Provide cover plates of same construction as box.

2.4 ELECTRICAL BOXES AND FITTINGS

A. Outlet boxes shall be one-piece, or projection welded galvanized stamped steel for ganged sizes required. Sectional boxes are not be acceptable. Where necessary, boxes larger than standard shall be provided in accordance with the National Electrical Code to prevent crowding of conductors. Outlet boxes required for communications systems and mechanical control devices shall be installed under this section. Verify outlet box size required for systems other than electrical power from shop and manufacturer's drawings. Install outlets in accordance with those requirements.

B. Fire-rated walls and ceilings may require special consideration and hardware in order to conform to U.L. penetration details and requirements such as the size of allowable openings (square inches) allowed in gross area or between vertical studs in walls. Fire rated enclosures may also be required.

PART 3 - EXECUTION

3.1 MATERIALS APPLICATION

A. Outdoors

1. Exposed above ground: RNC, Schedule 40

2. Exposed above ground, subject to damage: RNC, Schedule 80

3. Underground: RNC, Schedule 40

4. Boxes and enclosures: NEMA 4.

B. Indoors

1. Exposed above floor: EMT

2. Exposed above floor, subject to damage: RMC

3. Under or within floor slab-on-grade: RNC, schedule 40

4. Within elevated slab: RNC, schedule 40

5. Concealed within floor trusses, ceiling spaces, wall cavities, etc.: EMT

6. Damp or wet listed locations: RNC

3.2 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot water pipes. Install horizontal raceway runs above water piping. Do not install horizontal raceways above or below steam piping.

B. Unless noted otherwise, conduit run indoors is to be concealed within finished ceilings, wall, and floors.

C. Exposed conduits in damp or wet locations and where exposed to weather shall be installed with off-set brackets or supports to maintain a clearance of at least 1" to finished surface.

D. For slab-on grade construction, rigid conduit shall be installed below floor slab under curing or damp proofing membranes. Sub-contractor performing work under this section of specifications shall be responsible for maintaining integrity of damp-proofing membranes penetrated by raceways or boxes.

E. Penetrations through roofs shall be made using approved pitch pockets with construction details conforming to roofing construction.

F. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

G. Conduits in slabs other than slab-on grade shall be installed as close to middle of slabs as practical without disturbing reinforcement. Parallel runs of conduit shall not be spaced closer than 3 diameters on centers except at cabinet and outlet box locations. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Raceways crossing expansion joints in concrete slabs shall be installed with expansion fittings.

H. Where rigid conduit is installed into a cabinet, box or gutter, use insulating throat bushing T&B series 222, 0-Z type A or RACO series 1402. Use two T&B series 141 lock-nuts to secure conduit to enclosure. Grounding bushing shall be 0-Z type BL. Expansion/deflection fittings shall be 0-Z type DX.

I. Connect motors and equipment subject to vibration with flexible conduits. In interior dry locations, FMC shall be used. In interior locations subject to minor amounts of moisture, LFMC shall be used. In exterior and interior wet locations, LFNC-B shall be used. All flexible conduits shall have separate bond wire except fixture tails. Any flexible connections located in listed/classified locations shall be in accordance with the wiring methods for that location.

J. Penetrations of all fire rated walls and ceiling-floor assemblies must be in strict accord with the approved and listed either U.L. assemblies, 3-M Company, or U.S. Gypsum details, alternate penetration methods will be approved if acceptable to the Code Authority having Jurisdiction.

K. It is to be noted that all raceways within the Elevator machine room shall be in metal conduit, no PVC allowed.

L. Boxes for wall and ceiling outlets shall finish flush and straight at edge of finished surface. Wall outlets in exposed concrete block, masonry and tile walls shall be installed with extra-deep square corner boxes or with standard boxes and square cornered tile wall covers, so that conduit off-sets are not required. Outlet boxes for light fixture mounting shall be equipped with fixture studs. No outlets shall be installed back-to-back in any wall.

M. Outlet boxes for switches shall be 4" from door jamb. Outlets occurring above counters, cabinets, or mirrors shall be correlated by Contractor so that outlet clears trim or is located in back splash as noted on drawings. See architectural interior elevations for locations.

N. All conduit and box installation is to be completed prior to any conductor installation.

O. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

3.3 INSPECTION

A. Contractor shall verify all conduit fittings such that there is no play in the connection.

B. Repair any damage to any paint, enamel, or galvanizing coatings with manufacturer recommended touchup coating.

END OF SECTION 260533

SECTION 260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes identification requirements for raceways, power and control cabling, conductors, equipment, and other electrical systems.

1.2 GENERAL

A. Coordinate all identification and labeling with other trades for proper equipment names.

B. Coordinate all identification and labeling with requirements of other Sections requiring identification, Drawings, Shop Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual with requirements of local Codes and applicable Standards.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70, ANSI 13.1, and ANSI C2.

PART 2 - PRODUCTS

2.1 RACEWAYS

A. Labeling shall be black letters on orange background and indicate voltage and system type.

B. Self-adhesive labeling shall be preprinted by machine. Material shall be permanently flexible and laminated with a clear, all-weather, chemical & UV resistant film. Edges shall be taped with matching tape to protect label edges.

C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

2.2 POWER & CONTROL CABLING

A. Self-adhesive labeling shall be preprinted by machine. Material shall be permanently flexible and laminated with a clear, all-weather, chemical & UV resistant film. Edges shall be taped with matching tape to protect label edges.

2.3 CONDUCTORS

A. Color coding tape shall be 3 mil, self adhesive, 1 to 2 inch wide.

B. Self-adhesive labeling shall be preprinted by machine. Material shall be permanently flexible and laminated with a clear, all-weather, chemical & UV resistant film. Edges shall be taped with matching tape to protect label edges.

C. Marking tape shall be self adhesive vinyl wrap-around type with machine printed text.

2.4 EQUIPMENT

A. Engraved, laminated acrylic or melamine label prepunched or drilled for riveting to equipment. White letters on a dark-gray background with minimum letter height shall be 3/8 inch.

B. Panel schedules shall be machine printed with each circuit clearly identified.

2.5 SIGNAGE

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes. Signs shall be engraved with black letters on white face, prepunched or drilled for mechanical fasteners.

2.6 WARNING LABELS AND SIGNAGE

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-adhesive warning labels are to be factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Signage is to have a nominal size of 7 by 10 inches.

D. Warning labels and signage shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.7 WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.

2. Printing on tape shall be permanent and shall not be damaged by burial operations.

3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to destructive substances commonly found in soils.

4. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum foil core, and a clear protective film to allow inspection of the continuity of the conductive core, bright- colored, continuous-printed on one side with the inscription of the utility, compounded for direct burial service.

5. Overall Thickness: 8 mils.

6. Foil Core Thickness: 0.35 mil.

7. Weight: 34 lb/1000 sq. ft.

8. 3-Inch Tensile According to ASTM D 882: 300 lbf, and 12,500 psi.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.

2. Power marking tape to be red colored and shall marked with “ELECTRIC LINE, HIGH VOLTAGE”.

3. Communications marking tape to be orange colored and marked with one of the following (depending on system installed): “TELEPHONE CABLE”, “CATV CABLE”, “COMMUNICATIONS CABLE”, “OPTICAL FIBER CABLE”.

PART 3 - EXECUTION

3.1 GENERAL

A. Conduits & Raceways shall be marked and labeled as follows:

1. Accessible conduits, raceways, and boxes shall be factory colored. Colors shall be:

| | |
|---|---|
| a. 120/240 (or 208) Volt Normal Power | Yellow |
| b. 120/240 (or 208) Volt Emergency Power | Fluorescent Red |
| c. 277/480 Volt Normal Power | Fluorescent Yellow |
| d. 277/480 Volt Emergency Power | Fluorescent Orange |
| e. Isolated Ground | Orange “dot” on cover plate |
| f. Fire Alarm | Red |
| g. Telephone | Blue |
| h. Security | Purple |
| i. CATV | Black |
| j. Ground | Green |
| k. PA or Sound | Brown |
| l. Controls | White |

Optionally, contractor may spot mark systems with paint at 25' intervals on straight runs and 5' intervals in congested areas. Paint swatches shall be 6 inches and encircle conduits and raceways and shall cover entire cover plate of boxes.

2. Contractor shall coordinate exposed conduits in "architecturally finished" spaces. If requested by architect, contractor shall paint conduit to match architectural finish. Contractor shall not spot mark conduit with colors above in this instance. However, if conduit painting to match architectural finish extends into an open ceiling, conduit shall be marked above "ceiling" line.

3. Gang type junction boxes for installation of devices (receptacles, switches, etc) shall not have their faceplates marked as above. Instead, contractor shall mark interior of box.

4. Contractor shall label all boxes containing power cabling with the panel and circuit of origin of each conductor within the box. Marking shall be made with permanent black marker and stencil with 1/4" lettering.

5. Faceplates of telephone, security, CATV, PA, and sound devices shall small adhesive type labeling applied at each device indicating device number. Unique numbers shall be given to each device for ease of identification.

B. Cabling shall be marked and labeled as follows:

1. All power cabling shall be identified where it is accessible and in boxes, troughs, panels, etc. as follows:

   a. An identification label shall list panel and circuit of origin and shall be affixed to each individual cable.

2. Low voltage cabling (telephone, security, CATV, etc.) shall have outer jacket coloring to match colors delineated for conduits and boxes of same system above.

3. Telephone, security, CATV, PA, and sound cabling shall have adhesive type wrap labels applied indicating terminating device number. Labels shall be affixed at every location where cable can be accessed.

C. Conductors shall be marked and labeled as follows:

1. Power conductors shall have adhesive type wrap labels applied indicating panel and circuit of origin. Labels shall be affixed at every location where cable can be accessed.

2. Power conductors shall be identified by color as follows:

   a. Color coding of cabling on 120/208 Volt, Three Phase systems shall be:

      1) Phase "A" Black
      2) Phase "B" Red
      3) Phase "C" Blue
      4) Neutral White
      5) Ground/Bond Green

6) Switch Purple

Wiring of size #6 and smaller shall have factory colored insulation as listed above. Larger sizes may be marked by tape.

D. Equipment shall be marked as follows:

1. All equipment listed as NEMA 1, or located inside of building or structure (so long as location is not classified), shall have identification label riveted to enclosure.

2. All equipment listed other than NEMA 1, shall have stencil type label painted onto enclosure. Lettering shall be 1 inch tall (minimum) and of contrasting color to equipment enclosure.

3. In storage rooms, equipment rooms, and other rooms that may be used for storage by the Owner, contractor shall paint on floor boundaries of dedicated equipment space. Paint shall be a high-traffic, non-slip, epoxy type, yellow in color. Boundary stripes shall be 2 inches in width. The words "DEDICATED EQUIPMENT SPACE – NO STORAGE PERMITTED" shall be painted into boundary with same paint. Lettering shall be 2 inches in height and shall be stenciled. Contractor shall not apply this to finished rooms such as offices, break rooms, or other normally occupied spaces finish with architectural type finishes.

4. Panels shall have machine printed panel schedules affixed to inside of door. Schedules shall indicate all circuits (including "SPARES" and "SPACES"), panel designation, origin and size of service feed, voltage, phase, and buss size.

5. Panels shall have the conduit and conductor color coding legend indicated above posted on them.

3.2 INSTALLATION

A. Coordinate and verify each item prior to installation of identification labeling.

B. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Coordinate the installation of labeling to occur after the application of surface textures and/or painting of surfaces or equipment which may impair legibility of verbiage. Labeling shall also occur prior to the installation of any ceilings or barriers to make equipment generally inaccessible.

D. Color tape shall be wrapped around individual conductors for 6 inches with 1/2 laps. Start and terminate wrap with three passes with no tension to prevent unraveling.

E. Clean surfaces to have self-adhesive type markings applied with methods recommended by the marking's manufacturer.

END OF SECTION 260553

SECTION 262816

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements and specifications for enclosed switches and circuit breakers rated 600 Volts and less.

1.2 GENERAL

A. Pull-out type disconnect switches are not acceptable for any installation.

B. Furnish and provide enclosures rated for environments in which they are to be installed.

1.3 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types.

2. Current and voltage ratings.

3. Short-circuit current ratings (interrupting and withstand, as appropriate).

4. Include evidence of NRTL listing for series rating of installed devices.

5. Detail features, characteristics, ratings, and factory settings of individual over-current protective devices, accessories, and auxiliary components.

6. Include time-current coordination curves (average melt) for each type and rating of over-current protective device; include selectable ranges for each type of over-current protective device.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

C. Wiring Diagrams: For power, signal, and control wiring.

D. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

E. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

F. Time-current coordination curves (average melt) for each type and rating of over-current protective device; include selectable ranges for each type of over-current protective device.

1.4 QUALITY ASSURANCE

A. Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.

B. Drawings to indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Equipment to be UL listed.

D. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, manufacturers offering equipment which may be incorporated in the work are:

1. Square D.

2. G.E.

3. Cuttler Hammer

2.2 MOLDED CASE CIRCUIT BREAKERS

A. Thermal-Magnetic Circuit Breakers shall have and inverse time-current element for low-level overloads and an instantaneous magnetic trip element for short circuits. Adjustable magnetic trip settings shall be provided for circuit-breaker frame sizes 250 A and larger.

B. Lugs shall be provided that are large enough to accommodate all of the conductors as called for on plans. They shall be of adequate capacity to accommodate hi-press/swaged fittings for any aluminum conductors.

C. Accessories as required by plans:

1. Ground-fault protection shall comply with UL 1053. The trip mechanism shall be integrally mounted, self-powered with mechanical ground-fault indicator. Provide a relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.

2. Shunt trip coil energized from separate circuit, 120V AC coil voltage, with clearing contact.

## 2.3 FUSED SWITCHES

A. General duty, single throw, 240-V ac, 800 A and smaller switches shall be horsepower rated, with cartridge fuse interiors to accommodate indicated fuses, lockable handle with capability to accept at least one padlock, and interlocked with cover in closed position.

B. Heavy duty, single throw, 600-V ac, 1200 A and smaller switches shall be horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept at least one padlock, and interlocked with cover in closed position.

C. Lugs shall be provided that are large enough to accommodate all of the conductors as called for on plans. They shall be of adequate capacity to accommodate hi-press/swaged fittings for any aluminum conductors.

D. Accessories as required by plans:

1. Equipment ground kit shall be internally mounted and labeled for copper and aluminum ground conductors.

2. Neutral kit shall be internally mounted and insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

3. Class R fuse kit to provide rejection of other fuse types when Class R fuses are specified.

4. Service-rated switches shall be labeled for use as service equipment.

## 2.4 NONFUSIBLE SWITCHES

A. General duty, single throw, 30 to 60 A shall be, molded case type disconnect switches.

B. General duty, single throw, 100 to 600 A shall be, horsepower rated, lockable handle with capability to accept at least one padlock, and interlocked with cover in closed position.

C. Heavy duty, single throw, 600-V ac, 1200 A and smaller shall be horsepower rated, lockable handle with capability to accept at least one padlock, and interlocked with cover in closed position.

D. Lugs shall be provided that are large enough to accommodate all of the conductors as called for on plans. They shall be of adequate capacity to accommodate hi-press/swaged fittings for any aluminum conductors.

E. Accessories as required by plans:

1. Equipment ground kit shall be internally mounted and labeled for copper and aluminum ground conductors.

2. Neutral kit shall be internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in fusible devices.

E. Comply with NECA 1.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:

B. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.

C. Test continuity of each circuit.

D. Tests and Inspections:

E. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

F. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

G. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

H. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

I. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 ADJUSTING

3.5 Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816