



CITY OF HOUSTON

INVITATION TO BID

Issued: October 22, 2010

Bid Opening:

Sealed bids, in duplicate, will be received by the City Secretary of the City of Houston, in the City Hall Annex, Public Level, 900 Bagby, Houston, Texas 77002 until **10:30 A.M. Thursday, November 18, 2010**, and all bids will be opened and publicly read in the City Council Chamber, City Hall Annex, Public Level, 900 Bagby at 11:00 A.M. on that date for the purchase of:

**REPLACEMENT OF A 225 TON AIR COOLED CHILLER (CHILLER No. 2)
FOR THE PUBLIC WORKS AND ENGINEERING DEPARTMENT
Bid No. S50-C23781
NIGP Code: 914-50**

Buyer:

Questions regarding this solicitation should be addressed to Arturo Lopez, Senior Procurement Specialist, at **832-393-8731** or e-mail to arturo.lopez@houstontx.gov.

Electronic Bidding:

In order to submit a bid for the items associated with this procurement, you must fill in the pricing information on the "PLACE BID" page.

Prebid Conference:

A Pre-Bid Conference will be held for all Prospective Bidders in the Strategic Purchasing Division, Concourse Level (Basement), Conference Room, #1 City Hall, 901 Bagby, at **10:00 a.m. on Wednesday, November 3, 2010**. The site visit will be scheduled at the pre-bid conference.

All Prospective Bidders are urged to be present. It is the bidder's responsibility to ensure that they have secured and thoroughly reviewed all aspects of the solicitation documents prior to the Pre-Bid Conference. Any revisions to be incorporated into this solicitation document arising from discussions before, during and subsequent to the Pre-Bid Conference will be confirmed in writing by Letter(s) of Clarification prior to the bid due date. Verbal responses will not otherwise alter the specifications, terms and conditions as stated herein.

Bidding forms, specifications, and all necessary information should be downloaded from the Internet at www.houstontx.gov/purchasing/index.html. By registering and downloading this solicitation document, all updates to this solicitation document will be automatically forwarded via e-mail to any registered bidders. This information may also be obtained from the Supplier Assistance Desk, Strategic Purchasing Division, 901 Bagby, Concourse Level, Houston, Texas 77002.

The place of the bid opening may be transferred in accordance with Paragraph (b), (5) of Section 15-3 of The Code of Ordinances, Houston, Texas. The bid-opening meeting may be rescheduled in accordance with Paragraph (b), (6) of said Section 15-3.

The City reserves the right to reject any or all bids, or to accept any bid or combination of bids deemed advantageous to it.

City employees are prohibited from bidding on this solicitation in accordance with the Code of Ordinances Section 15-1.

***CONTENTS:**

- A. OFFER
- B. SCOPE OF WORK/SPECIFICATIONS
- C. GENERAL, SUPPLEMENTARY CONDITIONS AND BOND FORMS

*NOTE 1: Actual page numbers for each section may change when the solicitation document is downloaded from the Internet or because of letters of clarification. Therefore, bidders must read the solicitation document in its entirety and comply with all the requirements set forth therein.

*NOTE 2: **To be considered for award please submit the electronic bid form and the forms listed in section A, including the signature page, which must be signed by a company official authorized to bind the company and a 10% Bid Bond.**

SECTION A



**FORMAL ONE-TIME BID
REPLACEMENT OF A 225 TON AIR COOLED CHILLER (CHILLER No. 2)
FOR THE PUBLIC WORKS AND ENGINEERING DEPARTMENT
Bid No. S50-C23781
NIGP Code: 914-50**

To The Honorable Mayor
and City Council Members
of the City of Houston, Texas (the "City"):

The undersigned hereby offers to provide services necessary to **Replace a 225 Ton Air Cooled Chiller (Chiller No 2) at the City's Wastewater Operations, Beltway Central Laboratory, located at 10500 Bellaire Boulevard, Houston, TX**, F.O.B. destination point Houston, Texas, in accordance with the City's Specifications and General Terms & Conditions and/or samples/drawings provided herein. When issued by the City of Houston, Letters of Clarification shall automatically become part of this bid document and shall supersede any previous specifications or provisions in conflict with Letters of Clarification. It is the responsibility of the bidder to ensure that it has obtained all such letters. By submitting a bid on this project, bidder shall be deemed to have received all Letters of Clarification and to have incorporated them into the bid.

The City may accept this bid offer by issuance of a Notice of Award Letter and/or a Purchase Order at any time on or before the 120th day following the day this Official Bid Form is opened by the City. This offer shall be irrevocable for 120 days after bid opening or for 90 days after City Council awards the bid, whichever comes last, but this period may be extended by written agreement of the parties.

The City reserves the right to INCREASE quantities during the twelve-month period following the issuance of the first purchase order subject to agreement in writing by the Prime Contractor/Supplier to honor the same bid price.

The City reserves the option, after bids are opened, to adjust the quantities listed on the electronic bid form upward or downward, subject to the availability of funds, and/or make award (s) on a line item basis.

SECTION A

Documents/forms must be downloaded from the City's Website
<http://www.houstontx.gov/purchasing/index.html>

Additional Required Forms to be Included with this bid:

In addition to the electronic Bid Form and the Official Signature Page, the Forms listed in Table 1 **must be completed and submitted to the Office of the City Secretary on or before the date and time the bid is due:**

Table 1
Affidavit of Ownership
Fair Campaign Ordinance
Statement of Residence
Conflict of Interest Questionnaire
Pay or Play Contract Compliance Acknowledgement Form 1a
10% Bid Bond
Contractor References

Table 2 lists other documents and forms that should be viewed/downloaded from the City's website, but are not required to be submitted with the bid. The City will request these forms, as applicable, to be completed and submitted to the City by the recommended/successful bidder:

Table 2
Formal Instructions for Bid Terms
Drug Forms
Insurance Certificates Over \$50,000.00
OCP Insurance Certificate Over \$100,000.00
Pay or Play Form 2 / Certification of Agreement to Comply
Performance, Maintenance and Statutory Payment Bonds
2010 Building Construction Wage Rate

Questions concerning the Bid should be submitted in writing to: City of Houston, Strategic Purchasing Division, 901 Bagby, Room B506, Houston, TX 77002, Attn: Arturo Lopez or via fax: 832-393-8759 or via email (preferred method) to arturo.lopez@houstontx.gov no later than **4:00 PM, Monday, November 8, 2010.**

SITE INSPECTION

The City of Houston reserves the right to inspect the bidder's current place of business to evaluate equipment condition and capabilities, staff experience, training and capabilities, and storage capabilities as they relate to the performance of this contract.

PERMITS:

Successful Contractor shall be responsible for securing any and all permits for proposed work. Any fee charged for these permits should be the responsibility of the Contractor and not the City of Houston.

CITY BUILDING CODES:

All work performed or equipment installed shall be in strict accordance with the City of Houston Building Codes. The Contractor will immediately correct any deficiencies discovered during work or after completion. Failure to correct deficiencies will result in the City having corrections made at the Contractor's expense.

BID BOND:

The Contractor shall be required to provide and submit with the bid a Bid Bond in the amount of 10% of the total amount bid by the Contractor. The Bid Bond shall be in the same form as that distributed by the City, and attached hereto, all duly executed by this Bidder (as "Principal") and by a corporate surety company licensed to do business in the State of Texas, and if the amount of the bond is greater than \$100,000.00 the surety must hold a certificate of authority from the United States Secretary of the Treasury, or a Cashier's or a Certified check in a like amount. Company or personal checks are not acceptable.

PERFORMANCE BOND and PAYMENT BOND:

The successful Contractor(s) shall be required to provide a Performance and Payment Bond in the total amount (100%) of the Contract if the award is in excess of \$25,000.00.

The Performance and/or Payment Bond shall be in the same form as that distributed by the City, and attached hereto, all duly executed by this bidder (as "Principal") and by an incorporated surety company licensed to do business in the State of Texas. If the amount of the bond is greater than \$100,000.00 the surety must hold a certificate of authority from the United States Secretary of the Treasury.

The Contractor(s) shall be required to provide a Performance and/or Payment Bond as outlined above, which will be delivered to the City Purchasing Agent of the City, on or before the tenth (10th) day following the day the bidder receives notice from the City.

MAINTENANCE BOND:

The Contractor shall furnish a maintenance bond in the total (100%) bid amount in the form required by the City (samples attached). One bond, also referred to as the One Year Maintenance Bond, will be conditioned upon Contractor's repair, replacement or restoration of any work or any portion of the work which is found to be defective or fails in any way to comply strictly with this contract or the plans and specifications for such work within a period of one (1) year from the date of acceptance of such work by the City Council or after the date that the "CO", or its designee in writing, determines, in a written notice to the Contractor, to be the date upon which the project is both substantially complete and available for the full and beneficial occupancy or use of the City.

QUALITY AND WORKMANSHIP:

The bidder must be able to demonstrate upon request that it has performed satisfactorily, services similar to the services specified herein. The bidder will provide records of warranty and repair services performed for others upon request. The City of Houston shall be the sole judge whether the services performed are similar to the scope of services specified herein.

CONTRACTOR'S QUESTIONNAIRE

In order to receive bid award consideration, the bidder must be able to demonstrate that they are currently providing or have had at least one contract, for **Heat Ventilation and Air Conditioning, (HVAC) Installation** that is similar in size and scope to this contract. **Bidder must have references documenting that it has performed Heat Ventilation and Air Conditioning, (HVAC) Installation.** The reference(s) should be included in the space provided below. Please attach another piece of paper if necessary. If references are not included with the bid, the bidder shall be required to provide such references to the City of Houston within five working days from receipt of a written request from the City of Houston to do so. **Bidder's capability and experience shall be a factor in determining the Contractor's responsibility.**

1. Business Name: _____

Business Address: _____

City, State, Zip: _____

Name of Owner/Contact Person:

Phone: _____ Fax: _____ Email: _____

No. of Years providing Service to this business: _____

2. Business Name: _____

Business Address: _____

City, State, Zip: _____

Name of Owner/Contact Person:

Phone: _____ Fax: _____ Email: _____

No. of Years providing Service to this business: _____

3. Business Name: _____

Business Address: _____

City, State, Zip: _____

Name of Owner/Contact Person:

Phone: _____ Fax: _____ Email: _____

No. of Years providing Service to this business: _____

SECTION B
SCOPE OF WORK

1.0 General:

- 1.1 The Contractor shall provide all materials, labor, equipment, transportation, insurance, permits, bonds and other services necessary to remove and properly dispose of the existing 215 ton, Trane RTAA air cooled chiller and furnish and install a new 225 ton Trane RTAC air cooled chiller or City approved equal. at the City's Wastewater Operations, Beltway Central Laboratory, located at 10500 Bellaire Boulevard, Houston, TX.
- 1.2 The new chiller must be installed in the space occupied by existing unit and connected to the existing chill-water piping, electrical supply. The Building Automation System wiring and controls must also be reconnected.
- 1.3 The new chiller must be placed on neoprene isolators. All electrical disconnect and reconnect must be included and the existing block valves must be reused.
- 1.4 All work shall be performed on straight time and all final factory start-up work shall result in a complete ready-to-use system.
- 1.5 All work performed by the Contractor shall be in accordance with the latest City of Houston Building, Electrical, Plumbing Codes and other related City of Houston Standard Construction Specifications. In the event that more than one Code or standard addresses a construction issue, the most stringent requirement shall prevail. It shall be the responsibility of the Contractor to obtain and pay for all necessary permits.

2.0 Performance Time:

- 2.1 The Contractor shall have 120 calendar days to complete all work associated with and required by the contract after receipt of the written Notice to Proceed from City.

3.0 Warranty:

- 3.1 The Contractor shall warranty the 225 ton, air cooled chiller, associated equipment and service for a ***period of five years***. The warranty shall include all parts, labor, material, refrigerant, maintenance (including 3 quarterly inspections and an annual each year) and transportation cost associated with either performing the warranty repairs on site or at the contractor's facility. The warranty shall begin subsequent to certification and acceptance of the equipment by the City.

4.0 Specified Equipment, or Equivalent:

- 5.1 Wherever in the specifications any materials or processes are indicated or specified by patent of proprietary name and/or by name of manufacturer, such specifications shall be deemed to be used for the purpose of facilitating descriptions of the performance, materials and/or processes desired and shall be deemed to be followed by the words, "or equivalent", if not so stated in the specifications herein.

- 5.2 The burden of proof shall rest with the bidder, in the course of a technical evaluation, to prove that the proposed item(s) are equivalent to the performance, materials, processes, or articles specified. DETERMINATION AS TO WHETHER THE ITEM (S) BID IS (ARE) EQUIVALENT TO THOSE SPECIFIED SHALL REST SOLELY WITH THE CITY PURCHASING AGENT AND THE RECEIVING DEPARTMENT.

**TECHNICAL SPECIFICATIONS
REPLACEMENT OF AN AIR-COOLED CHILLER**

PART ONE PRODUCT

1.0 PRODUCT DATA - AIR-COOLED HELICAL ROTARY WATER CHILLER

- 1.0.1 Trane Air Cooled Chiller, Series R(TM), Model RTAC, **or City approved equal.**
- 1.0.2 The chiller must operate at 225 nominal tons
- 1.0.3 The chiller must operate at 460 Volts /60 Hz /3 Phase
- 1.0.4 The chiller must operate with startup allowance
- 1.0.5 The chiller must be a standard configuration
- 1.0.6 The chiller must be a C/UL Listing
- 1.0.7 The chiller must operate at American Society Heat/Refrigeration and Air Conditioning Engineers, (ASHRAE) 90.1 compliant.
- 1.0.8 The chiller must operate in compliance with the American Refrigeration Institute, (ARI) certification.
- 1.0.9 The chiller must operate in compliance with the American Society of Mechanical Engineers, (ASME).
- 1.0.10 Standard 40-60F leaving chill water temperature, with evaporator heaters.
- 1.0.11 The chiller must operate with a 2 pass arrangement, insulated.
- 1.0.12 The chiller must operate at a low ambient capability.
- 1.0.13 The chiller must operate with aluminum fins.
- 1.0.14 The chiller must operate with totally enclosed air-over fan motors.
- 1.0.15 The chiller must operate with a across the line starter.
- 1.0.16 The chiller must operate at single point power connection.
- 1.0.17 The chiller must operate with a non-fused disconnect switch.
- 1.0.18 The chiller must operate with a remote leaving temp and current setpoint.

1.0.19 The chiller must operate with refrigerant isolation valves.

1.0.20 The chiller must operate with access guards and coil protection.

1.0.21 The Contractor shall finalize all work to factory startup.

1.1 PERFORMANCE DATA - TRANE AIR-COOLED HELICAL ROTARY WATER CHILLER

1.0.1	Tags	RTAC225
	Capacity (tons)	216.30
	Compressor power (kW)	251.30
	Unit power (kW)	270.90
	Efficiency (EER)	9.6
	Evap entering temp (F)	54.00
	Evap leaving temp (F)	44.00
	Evap flow rate (gpm)	517.10
	Evap pressure drop (ft H ₂ O)	17.90
	Evap fluid concentration (%)	0.00
	Evap fouling factor (hr-sq ft-deg F/Btu)	0.00010
	Ambient air temp (F)	95.00
	RLA - compressor A (A)	200.00
	ERA - compressor A (A)	1065.00
	RLA - compressor B (A)	168.00
	LRA - compressor B (A)	878.00
	Single point power MCA (A)	454.00
	Ckt 1 Charge (HFC-134a) (lb)	225.0
	Ckt 2 Charge (HFC-134a) (lb)	215.0
	COP (COP)	2.81
	Single point power MOP (A)	600.00
	IPLV (EER)	13.7
	NPLV (EER)	13.7
	A-wcighted sound pressure (dBA)	75

PART TWO – MECHANICAL SPECIFICATIONS

2.0 MECHANICAL SPECIFICATIONS - AIR-COOLED HELICAL ROTARY WATER CHILLER.

2.0.1 General

2.0.1.1 The air cooled chiller must be leak and pressure tested at 390 psig (2689 kPa) high side, 250 psig (1724 kPa) low side, then evacuated and charged. The Air-Cooled Series R(TM) chillers must be factory tested to confirm operation prior to shipment. The chiller must ship with full operating charge of oil and refrigerant.

2.0.1.2 The chiller panels, structural elements and control boxes must be constructed of galvanized steel and mounted on a welded structural steel base. Chiller panels and control boxes must be finished with a baked-on powder paint, and the structural base with an air dry paint. All paint must meet the requirement for outdoor equipment of the City of Houston.

2.0.1.3 The chiller shall control the chilled water flow either directly or through an input to a building automation system to conduct an action resulting in minimum flow through the chiller evaporator barrel.

2.0.2 Evaporator

2.0.2.1 The evaporator must be a tube-in-shell heat exchanger design with internally and externally finned copper tubes roller expanded into the tube sheet. The evaporator must be designed, tested, and stamped in accordance with ASME for a refrigerant side working pressure of 200 psig (1379 kPa). The evaporator must be designed for a water side working pressure of 150 psig (1034 kPa). The chill water connections must be grooved pipe. Each shell shall include a vent, a drain, and fittings for temperature control sensors and is insulated with 3/4 inch Armaflex II or equal insulation (K=0.26). The insulation shall also cover the liquid and suction line and evaporator heads. Heaters, with thermostats, must be provided to help protect the evaporator from freezing at ambient temperatures down to -20 F (-29 C), depending on application. A separate low voltage power source must be provided to power the heaters, and shall be provided as necessary. Anytime water is present in the evaporator, a flow of the chilled water system must be present to avoid potentially catastrophic damage to the evaporator as a result of freezing.

2.0.3 Chilled Water Reset

2.0.3.1 The chilled water reset must control logic and factory-installed sensors to reset leaving chilled water temperature. The setpoint must be reset based on ambient temperature or return evaporator water temperature.

2.0.4 Pressure Vessel Code

2.0.4.1 The chiller shall comply with ASME Pressure Vessel Code. ASME nameplates must be attached to applicable pressure vessels including oil separators.

2.0.5 Condenser and Fans

- 2.0.5.1 The air-cooled condenser coils must have aluminum fins mechanically bonded to internally finned copper tubes. The condenser coil must have an integral subcooling circuit. Condensers must be factory proof and leak tested at 506 psig (3489 kPa).
- 2.0.5.2 The direct drive vertical discharge condenser fans must be dynamically balanced. Three phase condenser fan motors with permanently lubricated ball bearing and internal thermal protection must be provided. The direct drive vertical discharge condenser fans shall start and operate down to 0 F (-18 C) ambient.
- 2.0.5.3 The condenser and fans must provide Totally Enclosed Air-Over, (TEAO) motors completely sealed motor windings, preventing exposure to ambient conditions.
- 2.0.5.4 The condenser and fans must be designed to start and operate in upper ambient conditions, up to 115 degrees F (46 C).

2.0.6 Coil Protection

- 2.0.6.1 The architecturally pleasing, 1/2" engineered plastic, painted louvered panels must cover the complete condensing coil, providing coil protection from outside objects and louvered profile for coils.

2.0.7 Access Guard

- 2.0.7.1 The 4" square heavy wire mesh must cover the service area beneath the condenser coils, protecting the chiller components from outside access.

2.0.8 Low Ambient Option

- 2.0.8.1 The factory installed low ambient option shall consist of special control logic and variable frequency drive on the first fan of each circuit to permit low temperature start-up and operation to 0 F (-18C).

2.0.9 Compressor Starter - X Line

- 2.0.9.1 The compressor starter must be an across-the-line configuration. The compressor starter must be factory mounted and completely prewired to the compressor motor. The compressor starter must be housed in a weathertight enclosure.

2.0.10 Compressor and Lube Oil System

- 2.0.10.1 The rotary screw compressor shall be a semi-hermetic, direct drive, 3600 rpm, with step and variable load and unloader valves for capacity control, rolling element bearings, differential refrigerant pressure oil pump, and oil heater. The motor must be a suction gas cooled, hermetically sealed, two pole squirrel cage induction motor.
- 2.0.10.2 The oil separation shall be provided separate from the compressor. Automatically controlled valves must be provided on the compressor discharge and lube oil system. A solenoid valve in the lube oil return system must be provided. The oil filtration shall be accomplished by an integral oil filter located within the compressor.

2.0.11 Refrigerant Circuits

- 2.0.11.1 The chiller must have two refrigerant circuits, with one or two rotary screw compressor per circuit. Each refrigerant circuit must include compressor suction and discharge service valves, liquid line shutoff valves, removable core filter, liquid line sight glass, charging port, and one electronic expansion valve per circuit. The chiller must be equipped with fully modulating compressors and electronic expansion valves to provide variable capacity modulation over the entire operating range.

2.0.12 Chiller Controls

- 2.0.12.1 All chiller controls must be housed in an outdoor rated enclosure with removable plates to allow for City connection of power wiring and remote interlocks. All controls, including sensors, are must be factory mounted and tested prior to shipment.
- 2.0.12.2 The microcomputer controls shall provide all control functions including start up and shutdown, leaving chilled water temperature control, compressor and electronic expansion valve modulation, fan sequencing, anti-recycle logic, automatic lead/lag compressor starting, load limiting and chilled water pump control.
- 2.0.12.3 The chiller control module, utilizing Adaptive Control (TM) microprocessor, shall automatically take action to avoid unit shutdown due to abnormal operating conditions associated with low refrigerant pressure, high condensing pressure and motor current overload. Should the abnormal operating condition continue until a protective limit is violated, the chiller must have the ability to shut down.
- 2.0.12.4 A control power transformer must be factory installed and wired.

2.0.13 Controls Function Data

2.0.13.1 The chiller protective functions shall include loss of chilled water flow, evaporator freezing, loss of refrigerant, low refrigerant pressure, high refrigerant pressure, compressor starting and running over current, phase loss, phase imbalance, phase reversal, and loss of oil flow.

2.0.13.2 A menu driven digital display must be provided indicating over 20 operating data points including chilled water set point, current limit set point, entering and leaving chilled water temperature, evaporator and condenser refrigerant pressures and temperatures. The digital display shall be read and advanced on the chiller without opening any control panel doors. The chiller must have touch screen LCD, for easy access of all important chiller operating information.

2.0.14 Power Disconnect Switch

2.0.14.1 A non-fused molded case disconnect switch with through-the-door handle must be provided to disconnect the main power and cones pre-wired from the factory with terminal block power connections.

2.0.15 Power Connection

2.0.15.1 The chiller must be provided with a single-point electrical power connection. A field wiring connection point must be at the starter panel on single starter panel units, or at a junction box on the side of the chiller on dual starter panel units.

2.0.16 Control Inputs

2.0.16.1 The City's Building Automation System Communication Interface permits remote chilled water set point and current limit setpoint by accepting a 4-20 inA or 2-10 Vdc analog signal, must be re-connected.

2.0.17 Optional Items Required

2.0.17.1 The Air-Cooled Series R(TM) chiller must provide the following optional features;

1. Adsil corrosion resistant condenser coatings.
2. Condenser air deflector to prevent recirculation of hot discharge air though condenser as a result of building aerodynamics.

END OF SECTION

GENERAL CONSTRUCTION REQUIREMENTS

PART 1 - GENERAL

1.01 BIDDER'S REPRESENTATION

- A. Each bidder in submitting its bid proposal represents that they have read and understands the bidding documents, drawings and the specifications, including the portion of the work under other contractors, and has visited the project site, and familiarized himself/herself with the local conditions under which the project is to be performed.
- B. Each bidder represented that they have compared the site's existing conditions and compared it with the drawings and specifications, and satisfied himself/herself of the conditions of delivery, handling, storage of materials, and all other matters that are incidental to the work before submitting its bid or proposal.
- C. Each bidder represents that its bid or proposal is based upon the materials and/or equipment described in the project's drawings and specifications.
- D. Submission of a bid or proposal will be considered as evidence of the bidder's representation. No allowance will be made to the successful contractor by reason of any error or omission on its part due to neglecting the requirements of this article.

1.02 GENERAL STIPULATIONS

- A. Each contractor shall be responsible for the obtainment of all required trade permits under its contract, including the payment of all applicable fees to the governmental authorities with the jurisdiction over the project.
- B. The drawings, in many instances, are schematic and do not define exact locations or dimensions. Items furnished may vary in dimensions and other ways from the specific items called for in the drawings. In such cases, the contractor shall, prior to performing the work, determine the exact position or dimensions by means of field measurements, drawings furnished by the suppliers and/or coordination with other trades.
- C. Information as to existing conditions shown on the drawings reflect the best available data at the time the drawings were prepared, each contractor shall investigate and verify the data in the field prior to submitting its bid or proposal, and prior to start of field construction.

1.03 RELATION OF THE DOCUMENTS

- A. Complementary: The drawing and specifications are complementary and anything included in one, but not in the other shall be provided as if included completely in both. In case of conflict between the documents or within either, the Engineer shall determine the intent.

- B. Cost Basis: In case of conflicts, the requirement defining the greater quantity and/or the higher quality shall govern unless otherwise directed.
- C. Standard Reference Documents: Various Standards Association documents are included by reference such as ASTM, ACI, AISC, etc. Provisions of each of these documents are basic to the contract unless exceeded by the drawings or specifications. Where building code standards apply to similar provisions, they shall govern unless exceeded by the referenced standard drawings or specifications.
- D. General Conditions of the Construction Contract: Unless otherwise indicated in the contract documents, the "General Conditions for the Contract for Construction" fully applicable to this project is "AIA Document A201-2007" published by the American Institute of Architects.

1.04 CONTRACTOR'S USE OF PREMISES AND ACCESS

- A. Contractor's use of the premises shall be confined to established work and storage areas and approved access routes only, and he shall be responsible for protection and restoration to original conditions of all unaltered areas affected by the work.
- B. Where not otherwise shown, details of work area enclosures, determination of access ways, and other limitations of Contractor's use of existing premises shall be developed with the Owner before commencement of the work and recorded for mutual understanding of the parties, and thereafter, any required or advisable changes shall likewise be developed with the Owner and recorded.
- C. Protections: The Contractor is responsible for the installation of fences, barricades, temporary partitions, etc. with suitable locked doors or gates as required. These shall be provided for the protection of workers, occupants, the public and the work.
- D. Separate Contractors: Accommodation shall be made for the requirements of separate contractors working on the same project.

1.05 SCHEDULE OF VALUES

No later than 20-days following issuance of letter of intent by the Owner, the Contractor shall furnish to the Owner Representative the Schedule of Values listing the names of major subcontractors and the cost breakdown of each subcontractor or trade, separated by labor material and equipment cost for each.

1.06 TEMPORARY FACILITIES

- A. Lighting & Power: The contractor shall provide suitable lighting and power for all trades working on the project, including temporary wires for all poles, meter, lighting fixtures, expenses and charges for electric current, etc. At the completion of the project, or upon instructions from the Owner, all such temporary wires, poles, meters, etc. shall be removed from the project site.

- B. Water: The contractor shall provide all water requirements for the construction of the project, including all necessary connections and fees. At project completion or upon Owner's instructions all such temporary piping and fittings shall be removed from the project site.
- C. Sanitary: The contractor shall provide suitable portable toilets for the use of all workmen engaged on the project. Proper ventilation shall be provided and a sanitary condition maintained at all times. These facilities shall meet all local codes and regulations.
- D. Winter Heating: The contractor shall provide portable heaters for the use of all trades, and the protection from condensation of work in place, OSHA and local code fire safety requirements shall be observed at all times.
- E. Trash: A trash dumpster shall be provided by the contractor to facilitate the collection of construction debris. Hauling and appropriate fees to an approved dump site to be the responsibility of the Contractor.
- F. Field Office: Provide a weather tight transportable building to serve as job office available for subcontractors and engineer with lights, heat & A/C, and phone. Provide as a minimum, a plan rack, table and desk with proper drawings and specifications.
- G. Contractor shall be responsible for all Power and Utilities consumption costs until the official date of substantial completion determined by the Owner, Contractor and Engineer.

1.07 TAXES

- A. Each bidder shall include in its bid or proposal amount, all applicable taxes associated with labor, materials and/or equipment incorporated into the project.

1.08 COOPERATION WITH OTHER CONTRACTORS

- A. Each Contractor shall provide its own facilities to perform its work and shall cooperate with other contractors to facilitate the execution of theirs.

1.09 WARRANTY/GUARANTEE

- A. Warranty/Guarantee on all material, equipment and labor shall be for a minimum of 1-year from the date of Substantial Completion, additional Warranty/Guarantee as required by these specifications shall remain in full force and effect.

1.10 SAFETY MEASURES

- A. General Requirements: The contractor must also comply with Occupational Safety and Health Act (OSHA) Standards. OSHA Standards are subject to change. It is the Contractor's responsibility to maintain familiarity with OSHA Standards which are current.

- B. Electrical Work:
 - 1. Electrical work will not be performed on or near energized lines or equipment unless specified in the plans and specifications.
 - 2. The Contractor must make arrangements with the appropriate entities for de-energizing lines and equipment so that work may be performed. All outages shall be reported through the authorized representative of the Owner a minimum of 7 days, unless otherwise specified, prior to the beginning of the requested outages.
- C. Radiation Permits or Authorizations: Contractors contemplating the use of radioactive materials or radiation producing equipment while performing work on this contract must obtain written authorization from the Owner.
- D. Self-Propelled Elevating Work Platforms: All self-propelled elevating work platforms will be designed, constructed, maintained, used, and operated in accordance with the guidance provided in American National Standard for Self-Propelled Elevating Work Platforms (ANSI A92) together with any amendments, which may be in force at time contract is awarded.
- E. Supporting Systems: "Supporting Systems, i.e., piling, cribbing, shoring, etc., shall be designed by a qualified person that meets accepted engineering requirements. Submit supporting systems construction details and design, which bear the seal of a licensed professional engineer."
- F. Telephone: A telephone or equivalent means to immediately initiate emergency response services shall be accessible at the job site at all times while work is underway.
- G. Guarding of Sloped Roofs: A passive means of fall protection, such as guardrails or catch platforms, shall be used on all roofs where the fall distance exceeds six feet

1.11 CONSTRUCTION/ERECTION SUPPORTS AND LOADS

- A. The lateral stability of this structure is dependent on the total completion of all interconnected structural roof, wall, and floor framing/decking systems. The Contractor shall provide and adequately install and maintain all temporary supports such as temporary guys, lateral bracing, false work, cribbing, and any other type structural supports required for a safe erection operation to maintain stability of the structure until all structural systems are interconnected as required by the contract plans and specifications.

END OF SECTION

GENERAL COORDINATION

PART 1 - GENERAL

1.01 DAILY REPORT

- A Contractor shall prepare daily Field Report in format directed and submit to Owner's Representative weekly.

1.02 RELATIONSHIP BETWEEN TRADES

- A. Require cooperation and coordination between various Trades and Subcontractors whose work is dependent upon one another. Schedule such work so as to prevent delays in dependent work and so that all related work will progress together. Require each Trade or Subcontractor to make necessary provisions for the requirements of such other work areas. No additional compensation for extra work incurred through the lack of cooperation and coordination between various Trades and Subcontractors will be allowed.

1.03 ACCEPTANCE OF PRIOR WORK

- A. New Work: Work executed in relation to following work shall be inspected and notice given of any defects, improper workmanship or materials, or other conditions that would affect the satisfactory execution and permanency of such following work. No further work shall be executed until such defects or conditions have been corrected. The absence of any such notifications will be construed as an acceptance by these Trades or Subcontractors of the prior related work, and later claims of defects in this work will not in any way relieve the Prime Contractor from responsibility of the resulting defects.

1.04 MEASUREMENTS

- A. Verify the governing lines, levels and dimensions of the premises, establish the lines and levels for construction from the data as confirmed, tape all dimensions and turn all angles by instrument and verify by triangulation and closure. Verify dimensions on existing work and report in writing all differences from the documents. Submit request for the direction prior to proceeding with the work. Verify all dimensions of new work as constructed and make good all discrepancies as directed. Layout rough and finish construction horizontally and vertically as the work progresses and verify the placement of the work of the various trades and subcontracts.

1.05 DOCUMENTS AND STANDARDS AT THE SITE

- A. Drawings, Specifications and Addenda: One copy of the Drawings, Specifications and Addenda shall be kept in good order in the project office for ready reference. These copies shall not be taken on to the work. All Addendum changes shall be noted appropriately on the Drawings and in the Specifications before starting the work.

- B. Shop Drawings, Product Data and Samples: One copy of all approved Shop Drawings and Product Data bearing the Engineer's or Consultants' approvals shall be forwarded to the project office on receipt and kept in an orderly file system for ready reference for the duration of the project. One of each set of approved selection samples shall be kept in the field office together with storable approved workmanship samples. Workmanship samples made in place shall be identified and preserved until completion. Non-storable workmanship or product samples shall be located in protected site areas and preserved until completion of the governed work.
- C. Change Record Prints: The set of Drawings required by the General Conditions to be kept for the Owner's Representative at the site shall be marked CHANGE RECORD PRINTS. Do not use this set for construction purposes. Record and date each change made during construction on this set. At the time of Substantial Completion deliver the full set of Change Record Prints to the Engineer. The record Prints will be checked monthly by the Owner to determine that they are current. This will be a requirement for issuance of a Certificate for Payment.
- D. Standard Reference Documents: When directed, or as necessary to properly execute the work, copies of literature, standards and other data referred to but not included in the Specifications shall be available in the field office.

1.06 UTILITY SERVICE INTERRUPTIONS

- A. Whenever, as a result of this Work, there will be an interruption in any utility service to any existing facility, submit in writing at least 2 weeks prior to the anticipated interruption, a request to the Owner stating the predicted time and duration of the interruption. No such services may be interrupted without the Owner's approval.

1.07 SAFE LOADING

- A. The Contractor shall ascertain the design loads and shall not load or permit loading of the structure beyond the design limits either by shoring, stockpiling or otherwise, and he shall make good all spread, deflection, cracking or other damage to the structure due to such cause as directed without cost to the Owner.

1.08 CUTTING AND PATCHING

- A. Leave all chases, holes, and openings straight, true, and of proper size and cut those in existing work as may be necessary for the proper installation of the work. Consult with all Subcontractors concerned, regarding proper locations and size. In case of conflict between requirement for cutting and patching and any other requirement of the Work, submit request for direction before proceeding with the Work. In case of failure to leave or cut them in the proper place, they shall be cut afterward at no expense to the Owner.
- B. No excessive cutting will be permitted, nor shall any piers or other structural members be cut without prior approval.

- C. After such work has been installed, satisfactorily and carefully fit around, close up, repair, patch, and point up all cuts.
- D. All work shall be done with proper tools by careful workmen of the particular trade to which work belongs and shall be done without extra expense to the Owner.
- E. No description of specific cutting, patching, digging, etc., required for the work under a Specification Section that may be required for the proper accommodation of that work to the work of other trades shall relieve the Contractor from responsibility described herein. Execute this work with competent workmen skilled in the trade required.

END OF SECTION

Section 15000

HVAC GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL

- A. See provisions of Division 1.
- B. These Specifications are part of the contract documents and must be used in connection with the Drawings.

1.02 WORK INCLUDED

- A. The Contractor shall furnish all labor, materials, tools, transportation, equipment, services, facilities required for the complete and substantial installation of all HEATING, VENTILATING and/or AIR CONDITIONING work shown on the Plans or outlined in these Specifications. The work shall include all materials, accessories, and apparatus not specifically mentioned herein or noted on the Plans, but which are necessary to make a complete working installation of all systems shown on the Plans or described herein.
- B. Work consists of, but is not limited to:
 - 1. HVAC
 - a. Split system HVAC systems
 - b. Ductwork systems
 - c. Exhaust fans
 - d. Grilles, diffusers, louvers
 - e. Unit Heaters
- C. Related work described elsewhere:
 - 1. Painting unless otherwise noted
 - 2. HVAC control conduit

3. Flashing of roof openings
4. Electrical connections to HVAC and plumbing equipment

1.03 CODES, REGULATIONS, STANDARDS, PERMITS, AND FEES

- A. Work shall comply with pertinent local ordinances or regulations.
- B. Materials and equipment shall meet standards of and be approved by nationally recognized standards and testing authorities where such materials and equipment are available.
- C. Installation shall be by competent mechanics, thoroughly experienced in this type of work and performing this work in a neat and workmanlike manner.
- D. Contractor shall comply with safety and occupational health requirements of OSHA and of local authorities. Responsibility for compliance rests solely on the Contractor and cannot be abrogated by virtue of these Plans and Specifications or actions of the Owner, or Engineer.

1.04 CONTRACTOR QUALIFICATIONS AND RESPONSIBILITIES

- A. Any Contractor bidding on these Specifications and Drawings shall be a specialist in this field and have the personal skill and organization to provide a practical working system. Any practical criticism or exception given with the proposal will be considered at that time. If no criticism or exception is given with the proposal, it shall be assumed that the Contractor agrees that the system, as outlined in the Drawings and Specifications, can be made into a completely working system.
- B. Use of the term "Contractor", "HVAC Contractor", "Plumbing Contractor", "Electrical Contractor" or similar terminology in these Specifications is intended as an aid to the bidder only and to mean the organization engaged to execute the work included whether it be the General Contractor, its subcontractor, or others, and is not intended to indicate any jurisdictional assignments or other assignments of work, that being the responsibility of the General Contractor.
- C. The Specifications and accompanying Drawings are intended to encompass a system that will not interfere with the structural, mechanical, or architectural design of the building, and which will fit into the several available spaces. As it is not within the scope of the Drawings to show all necessary offsets, obstructions, or structural conditions, it shall be the responsibility of the Contractor to install its work in such a manner that it will conform to the structure, avoid obstructions, and interferences with other trades, and keep passageways clear.

1.05 PLANS AND SPECIFICATIONS

- A. Reference to Engineer from this point forward in these specifications shall be interpreted to mean the person designated by the Owner to interface with the Contractor.

- B. The Drawings show diagrammatically the sizes and location of the various outlets and equipment items and the sizes of the major interconnecting ducts, etc., without showing exact details as to elevations, offsets, control lines, and installation details.
- C. The Contractor shall carefully lay out its work at the site to conform to the architectural and structural conditions and to avoid obstructions. Exact locations of outlets, apparatus, and connections thereto shall be determined by reference to the general plans, to all detail Drawings, roughing-in Drawings, etc., by measurement at the building and in cooperation with other Contractors and in all cases shall be subject to the approval of the Engineer.
- D. It shall be the Contractor's responsibility to visit the actual site and compare same with the Drawings and Specifications, ascertain and check locations of any existing obstructions, underground or otherwise, which may affect the work. Failure to determine conditions will not be considered cause for granting additional compensation. Submittal of bid shall constitute constructive agreement that the site has been visited and that no circumstances will adversely affect the work other than those shown on the Plans.
- E. In case of conflict between Plans and Specifications, or discrepancies within Plans and/or Specifications, the Contractor shall request clarification from the Engineer. For purposes of bidding, the more expensive materials or method shall be bid. After clarifications, if the less expensive method or material is indicated, due credit will be issued.
- F. All ductwork and piping except in various equipment rooms, unfinished spaces, or where specifically designated herein or on the Plans shall be concealed in furrings or chases. Where conditions exist which would cause any of these items to be exposed in finished spaces, or to interfere with architectural features or work of other divisions, the Contractor shall immediately call the situation to the attention of the Engineer and shall stop work in those areas until the Engineer directs resumption of work.
- G. The Engineer shall have the right to clarify location of grilles, louvers, and diffusers, and to direct minor relocation of such items prior to rough-in at no additional cost to Owner.
- H. Do not scale Drawings. If location of grilles, diffusers, control devices, or equipment is not dimensioned on Drawing and is not obvious or fixed by architectural features, verify location prior to installation.
- I. Wall mounted equipment, devices, etc., shall be grouped neatly in a logical arrangement, in as aesthetically pleasing a manner as possible, and at the same height, unless otherwise indicated. Coordinate with other trades to satisfy this requirement.
- J. Contractor shall refer to architectural sheets in the set of Drawings and shall notify the Engineer of any difference from items shown on Drawings related to this section.

1.06 COORDINATION WITH OTHER SECTIONS

- A. Coordinate work with work of other trades in putting the installation in place at the time when the space required by this installation is accessible. Cutting and patching necessitated by any failure on the part of the Contractor to do this shall be performed at no additional cost to the Owner.
- B. Verify openings, supports, and space availability shown on plans for use of this Contractor or for installation of its equipment. If such items are not suitable, notify the Engineer immediately.
- C. Provide roof jacks, vents, sleeves, etc., as required for HVAC and plumbing equipment installation. Install these prior to final roof installation and coordinate with Roofing Contractor for flashing.
- D. Each trade shall coordinate with other trades to assure that plans properly reflect the correct equipment connection requirements for equipment furnished by that trade or connected by that trade.

1.07 WARRANTY

- A. In addition to all legally inherent warranties, the Contractor shall provide a written guarantee that:
 - 1. All material and equipment shall be new, free from defect, and of the quality and rating shown or specified.
 - 2. Any defect due to missing or improper material or faulty workmanship existing or developing during the resulting warranty period shall be corrected and the resulting damage repaired without additional cost to the Owner. Equipment replaced under warranty shall carry an additional one year warranty on equipment and labor.
 - 3. Period of warranty shall be as legally stipulated, but shall be a minimum of one year from the date of acceptance by the Engineer unless specifically extended by these Specifications for certain equipment.
- B. Above warranty shall be concurrent with manufacturer's warranties on equipment. Manufacturer's written warranties shall be submitted to the Owner as specified elsewhere.

1.08 MATERIALS

- A. Properly store all material and equipment at the job site, protecting same from the elements when in open storage and from damage by work of other trades when in place. Material improperly handled or damaged from rough usage or improper storage shall be taken out and replaced at no additional cost to the Owner with new units at the direction of the Engineer.
- B. Whenever a definite manufacturer's product is specified, it is the intent of these Specifications and Drawings to set a standard of performance and quality and to define features of the product. Unless "no substitutions" are indicated, products by other reliable manufacturers will be accepted, provided they have equal capacity, construction, features, performance, maintenance requirements, and other qualities deemed significant. Final approval,

however, shall rest with the Engineer at the time of submittal of Shop Drawings and brochures.

- C. It must be understood that the Contractor shall be responsible for all consequences of any substitution, e.g., required changes in space requirements, access, layout, and clearances; effect on related equipment; impact on building codes; impact on work and interface of other trades.
- D. Contractor shall verify that materials used in all phases of this work comply fully with local code requirements and are approved for use by the authority having jurisdiction. Notify Engineer prior to installation if use of any material is questionable.
- E. Submittal of bid by Contractor is assumed to be for the specified or scheduled material unless specifically noted at the time of submission of bid.
- F. Where performance criteria or specific features are listed for items of material or equipment, this requirement shall take precedence over manufacturer's designation or model number indicated.

1.09 SUBMITTALS

- A. Required submittals consist of three categories: Shop Drawings, Maintenance and Operations Literature, and Record Drawings. Contract shall not be considered complete until satisfactory compliance with all categories.

1. Shop Drawings

- a. Submit Shop Drawings in accordance with General Provisions. Contractor shall utilize Shop Drawings to assure coordination with and absence of interference with work of other trades, and compatibility with physical features of the project. Shop Drawings consist of brochures, catalog cut sheets, Drawings, specification sheets which completely describe all items. Shop Drawings shall be submitted per procedure described in general or supplemental conditions or, in absence thereof, shall be submitted in five (5) copies, four of which will be returned to the Contractor after review and appropriate comments. Purpose of review shall be to assure compliance with intent of design and shall not relieve Contractor of any responsibilities under the Contract. Material or items submitted will be held to comply exactly with characteristics of scheduled items or with specifications unless deviations are specifically noted on the submittal. See related requirements under Materials.
- b. Submit Shop Drawings on the following items and on any other items requested by the Engineer:
 - i. HVAC
 - a) Ductwork systems
 - b) Grilles, diffusers, louvers
 - c) Control components
 - d) Split system HVAC systems
 - e) Exhaust systems

f) Unit Heater

- c. Shop Drawings shall be submitted as early as practical providing ample time for review and re-submittal if required. Failure of the Contractor to receive returned submittal shall not relieve him of any obligation or responsibilities under the Contract.
- d. Shop Drawings shall be submitted in logical groupings including as few groups as possible. All submittals shall be signed by the submitting Subcontractor indicating its review and agreement with the submittals. Failure to sign shall be cause for rejection. Submittals shall be explicitly keyed to identifying numbers or symbols in the Drawings and Specifications.

2. Maintenance and Operations Literature

- a. Submit at conclusion of project, three (3) copies of permanent three-ring binders containing, for all installed items, manufacturer's Maintenance and Operation instructions, spare parts lists, installation instructions, etc. Specifically included shall be recommended periodic maintenance information for all items requiring periodic maintenance.
- b. Include also copies of all manufacturers' warranties. This compilation of information shall be properly identified on cover and back.

3. Record Drawings: Submit, at conclusion of project, one (1) set of prints, marked in red, to indicate as-built conditions including any deviations or changes whether covered by change order or not. Contractor shall secure from the Engineer one (1) set of prints for this purpose and this purpose exclusively. Prints submitted shall be marked "Record Prints", bear the name of the General Contractor and Subcontractor, and be signed by an officer of the submitting Subcontractor.

1.10 GENERAL REQUIREMENTS

- A. All equipment and materials shall be installed in conformance with manufacturer's recommendations and instructions unless in conflict with these Drawings and Specifications.
- B. Conform to specific requirements shown on the Drawings or described elsewhere in these Specifications. All equipment furnished and installed shall be properly secured in place. Follow manufacturer's recommendations unless otherwise indicated; use vibration isolators where applicable. (See NOISE AND VIBRATION).
- C. All piping, raceways, and equipment suspended from structure shall be supported with hangers designed for the purpose. Makeshift supports of wire are not acceptable. Hangers of perforated strap are not acceptable. Pipe support spacing shall be per Manufacturer's recommendations or as scheduled on the Drawings.
- D. Wall-mounted equipment, devices, etc., shall be grouped neatly in a functionally logical arrangement, and in as aesthetically pleasing a manner as

possible. Coordinate with other trades where their wall-mounted equipment is in close proximity.

- E. Penetrations through walls, ceilings, or floors shall be accomplished neatly. Where visible, penetrations shall be provided with appropriate trim. Penetrations through exterior walls shall be made weatherproof and insect-proof.
- F. Penetrations shall not impair the integrity of the wall, floor, or ceiling; e.g., dust-tight walls, soundproof walls, fire-rated walls, etc. Penetrations through roofs shall be made weatherproof.
- G. All ferrous metal of equipment or structures installed outdoors shall be galvanized or galvanized then painted, unless other treatment is specified or scheduled. All ferrous metal on equipment or structures installed indoors shall be painted, galvanized, or otherwise protected from rusting. Care shall be taken to protect integrity of finishes during handling, installation, field cutting, etc. Touch up all scratches, cuts, etc., with matching finish in a manner acceptable to Engineer.
- H. Unless otherwise noted, motor starters for HVAC equipment shall be furnished by Contractor furnishing such equipment, and shall be installed by Electrical Contractor.
- I. Unless otherwise indicated on the Drawings, hot water, where included in the project, shall have temperature set for 120° F maximum. Contractor shall verify temperature setting with thermometer.

1.11 NOISE AND VIBRATION

- A. Each of the various pieces of equipment shall operate without objectionable vibration or noise. All rotating equipment shall be in static and dynamic balance and shall be mounted, supported and fastened so that no equipment vibration is transmitted to building structure, piping, ductwork, or other equipment. Vibration isolation, if not otherwise specified, shall be in accordance with manufacturer's recommendations.
- B. If, in opinion of the Engineer, objectionable vibrations, or transmission thereof to the building occurs, the Contractor shall undertake such remedial measures as may be necessary to eliminate the objectionable condition at no additional cost to the Owner.

1.12 NAMEPLATE, IDENTIFICATIONS, AND MARKINGS

- A. The following shall be identified with engraved nameplates as described hereinafter:
 - 1. HVAC
 - a. Air handling units
 - b. Exhaust fans
 - c. Compressor/condenser units
 - d. Boiler
 - e. Unit Heaters

- B. Unless otherwise indicated, nameplates shall be black phenolic with chamfered edges engraved with minimum 3/16" letters to white core. Attachment will be made by stainless steel screws. Adhesive attachments will not be accepted.
- C. Nameplates on materials and equipment furnished will be maintained in original condition. Whenever possible, equipment shall be installed so that nameplates are readily visible. Damaged or unreadable nameplates shall be replaced. Where equipment is modified, nameplates shall be appropriately corrected.
- D. Location of underground piping shall be marked by the use of underground warning tape, colored with printed message. Tape to be buried directly over pipe, 6" below finished grade. Tape to be polyethylene, 6" wide. Tape for metallic pipe to be .004" thick; tape for non-metallic pipe to consist of two layers of polyethylene with a metallic film ribbon between.

1.13 DESIGN CONDITIONS

- A. The design of the Air Conditioning and Heating Systems are based on the data as shown on the Drawings including design temperatures and outside air requirements.
- B. Above parameters are with system tolerances, capabilities, and design limitations. Equipment used must be able to produce the design conditions.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 INSPECTION, TESTS, CLEANING, ADJUSTMENT

- A. Periodic inspections will be made during construction by Engineer and/or Owner. Contractor will have an experienced, knowledgeable representative accompany inspector, open enclosures, provide requested tests, etc.
- B. Contractor will provide a knowledgeable representative to demonstrate all systems to Owner's operating and maintenance personnel. This demonstration shall be set a minimum three (3) days in advance and shall be at a time specified by the Owner.
- C. Contractor shall test and balance system to meet original airflow quantities set forth on the Plans. The results of air balance tests are to be included in Maintenance and Operation Literature submittal. Results of tests are to be signed by the performing technician and by an officer of the sub-contractor.

- D. After installation is completed, all work shall be thoroughly cleaned of dirt, dust, oil, grease, etc.; air filters shall be clean at the acceptance of the project. Refer to "Filters" as specified hereinafter in this Section.
- E. Bearings shall be properly lubricated in accordance with manufacturer's recommendations.
- F. After systems have been cleaned and tested to satisfaction of Engineer, they shall be operated for a minimum period of one week and all necessary adjustments made to assure that systems are properly operating when turned over to the Owner.
- G. After installation is completed, all work shall be thoroughly cleaned of dirt, dust, oil, grease, etc., remove all protective covers and polish all chrome, brass, etc.

3.02 EQUIPMENT INSTALLATION

It is the intent of these construction documents to describe an installation in which equipment is positioned to provide adequate clearances for compliance with applicable

- A. codes, for proper operation, for efficient maintenance, and for effective repairs. Care shall be taken by the Contractor to accomplish this end. Conduit, piping, insulation, mounting hardware, suspension members, etc. shall be installed to maintain these clearances. Coordinate with other trades.
- B. If with careful and prudent planning, it is apparent that clearances indicated, or clearances recommended by the manufacturers, cannot be accomplished, the Contractor shall immediately notify the Engineer and stop the affected work until instructed to proceed. No additional compensation shall be due the Contractor for rework due to failure to notify the Engineer in a timely manner.

END OF SECTION

Section 15100

MECHANICAL, HVAC EQUIPMENT

PART 1 - GENERAL

1.01 GENERAL

- A. All provisions of Mechanical General Requirements, Section 15000, apply.

PART 2 - PRODUCTS

2.01 EXHAUST FANS

- A. Furnish and install exhaust fans as scheduled. Fans (other than rest room exhaust fans) shall be rated in accordance with standards of Air Moving and

Conditioning Association, Inc. (AMCA). Sound rating shall be available for all units in accordance with AMCA Standard 301.

- B. Belt drive fans shall utilize totally enclosed, fan cooled, ball bearing motors unless otherwise specified. Provide high quality, steel core belts.
- C. Roof mounted fans shall be equipped with curb caps. Fan housing shall have cylindrical venturi throat, enclosed wind bands with wing type, counter-balanced damper. Fan wheels shall have die formed blades, mounted on welded steel hubs, entire assembly balanced for vibration free operation. HVAC Contractor shall coordinate with General Contractor to assure that metal building roof has proper size curb, in proper location, and will support the weight of the fan.

2.02 SPLIT HVAC SYSTEMS

- A. Furnish and install split system HVAC systems as and of the ratings indicated on the Drawings.
- B. Split system shall consist of compressor/condenser unit, electric duct heater with evaporative coil, interconnecting refrigerant piping, accessory items, and controls. Compressor/condenser unit and air handling unit with evaporator coil shall all be of same manufacture. Combined system shall have an EER rating of 10 or greater per ARI Standard 210 and a SEER rating of 11 or greater per DOE test conditions.
- C. Compressor/condenser unit shall consist of compressor, condenser coil, condenser fan, controls, piping, and casing. Casing shall be of galvanized steel, properly treated, with a finish coat of outdoor baked enamel. Access panels shall allow for ready accessibility of all components. Base shall allow for draining of moisture. Openings shall be provided for refrigerant and electrical lines. Compressor shall be hermetically sealed, resiliently mounted, suction cooled, overload protected, internal pressure relief protected, have internal protection from excessive temperature and pressure, and have crankcase heater. Compressor shall have four year warranty, in addition to and beyond warranty specified elsewhere. Condenser coil shall be copper tube, aluminum fin and shall be protected by steel guards. Condenser fan shall have inherent overload protection.
- D. The contractor shall assure that control compartment is marked to indicate function. If not factory marked, laminated engraved legend plate shall be applied. If reset device is installed and not accessible from the exterior, the legend plate shall, in addition, read "Reset Inside".
- E. Air handling unit shall consist of a air handler with electric heating elements, duct mounted evaporator coil, expansion valve assembly. Air handler shall consist of blower/filter section, Electric heating section, and cabinet. Cabinet shall be construction of galvanized steel, properly treated with baked on enamel finish. Cabinet shall be insulated with minimum 1" thick fiberglass insulation; removable panels shall provide easy access to all components. Blower shall be centrifugal type, statically and dynamically balanced, forward curved, double inlet blower wheel, permanently lubricated bearings, adjustable belt drives. Motors shall be NEMA standard frame types. Filter racks shall

accommodate 1 1/2" filters and must be provided with hinged access doors for easy access to change filters. Filters shall be as hereinafter specified. Duct mounted evaporator coil shall be constructed of aluminum plate fins bonded to copper tubes by mechanical expansion. Coil shall be galvanized steel housing with drain pan, internally insulated with one-inch fiberglass insulation and flanged for ductwork connection.

- F. Interconnecting refrigerant piping shall be sized per manufacturer's recommendations. Provide suction line strainer, filter dryer, sight glass, and service valves. Insulate suction line with minimum 1" wall thickness insulation.
- G. Where refrigerant lines are over sixty feet in length, or vertical rise or drop exceeds twenty feet, obtain from the manufacturer a letter confirming validity of the warranty for the specific installation; submit letter in M&O binder heretofore specified.
- H. Refrigerant system controls shall include high and low pressure switches. Provide low ambient kit. Provide timed off control to require minimum five minute "off" period.
- I. Provide thermostat(s) as described elsewhere.
- J. Furnish and install auxiliary drain pans under air conditioning units where noted. Drain pans shall be constructed of 20 gauge galvanized sheet steel large enough to catch any overflow from unit served. Pans shall have 2" vertical sides, hemmed top edge, with all joints soldered.
- K. Provide for installation meeting Division 16 requirements, all motor starters required. Motor starters, unless otherwise noted, shall be NEMA 1, magnetic, line voltage type. Provide melting alloy type overload relays in each ungrounded conductor if blower motors are not integrally protected.

PART 3 - EXECUTION

Not applicable

END OF SECTION

Section 15105

MISCELLANEOUS EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Miscellaneous Equipment and other miscellaneous items if not specifically included under other Sections of these specifications.

1.02 UNIT PRICES

- A. No separate payment will be made for Miscellaneous Equipment under this section. Include payment in price for work of which this is a component part.

1.03 SUBMITTALS

- A. Submit under provisions of the project general requirements of this specification.
- B. Submit manufacturer's technical literature and test reports showing certified capacities.

PART 2 - PRODUCTS

2.01 INSECT SCREEN

- A. Square mesh hardware cloth (Birdscreen) shall be furnished and installed by the Contractor at all air intakes and exhausts and elsewhere where shown or required. Screens shall be galvanized steel #2 mesh, 19 gauge plain weave conforming to ANSI/ASTM A740-76. The minimum acceptable free area shall be 72%. Secure hemmed edge of hardware cloth to duct opening or louver with corrosion resistant bolts 8" on centers with minimum of three fasteners per side.

2.02 VENT FLUES

- A. Furnish and install the flues and accessories for all boilers and/or heaters as indicated on the drawings.
- B. Factory-built flues shall be laboratory tested and listed by the Underwriter's Laboratories, Inc. for use with the specified equipment burning gas or liquid fuels as described in NFPA 211, which produce exhausted flue gasses at a temperature not exceeding 1400°F under continuous operating conditions.
- C. The double wall flue shall have an outer jacket of Type 304 stainless steel .025" thick for sizes 6" through 24" and .034" thick for larger diameters. There shall be minimum 1" air space between the walls. The inner liner shall be .035" nominal thickness for all diameters.
- D. The flues shall comply with all national safety standards and building codes when installed according to the manufacturer's pre-printed installation instructions and the limits of its listing.
- E. Inner pipe joints shall be sealed by use of V bands and RTV Silicone sealant for flue gas temperature up to 600° F. For flue gas temperatures above 600° F, joints shall be sealed with V bands and High Temperature Joint Cement as outlined in the installation instructions supplied by the manufacturer.
- F. Flues extending above the roof shall be terminated as required by local codes or as required by NFPA 211, whichever is more stringent and shall be a minimum of 4 feet above the finished roof with a factory supplied flue cap. Wind bracing or tiebacks shall be provided as required.

- G. The actual design of each vent flue system shall follow the layout shown on the Drawings but shall be completely laid out and calculated by the flue manufacturer to suit actual equipment served, field conditions and thermal temperatures to: straight sections, elbows, offset, increases, tees, equipment, connections, supports, drains, ventilated roof thimble/flashing assemblies, stack caps and other required accessories. If recommended by the manufacturer for the proposed installation, a drain section with drain piping and trap shall be provided in vertical stacks.
- H. Flues shall be Model PS as manufactured by Amerivent or Selkirk Metalbestos.

2.03 DOMESTIC COLD WATER PRESSURE REDUCING VALVE ASSEMBLIES

- A. Domestic water pressure reducing assemblies shall be provided where indicated on the drawings. The pressure reducing assemblies shall have the capacities indicated in the schedule on the drawings and shall maintain a constant downstream pressure with the varying inlet pressure indicated over the minimum to maximum flow range listed in the schedule. The pressure reducing valves shall be selected to provide stable flow conditions without cavitation or valve chatter over the entire flow range specified. PRV piping, valves, and strainers shall be full size of incoming line. Valve shall be sized as scheduled or noted on the Drawings.
- B. The high flow pressure reducing valve shall be a hydraulically operated, pilot controlled diaphragm-type cast iron (ASTM-A48) body, globe valve with 303 stainless steel trim and suitable for a working pressure as indicated on the Drawings. The pressure reducing valve shall have an adjustable outlet pressure range suitable for the scheduled valve outlet pressure. The valve shall be stem guided at both ends and have a single removable seat and resilient disc. The pilot control shall be a bronze ASTM B-61 direct-acting, adjustable, spring loaded, normally open diaphragm valve designed to permit flow when controlled pressure is less than the spring setting. The control system shall include a fixed orifice and flow stabilizer or reduce low flow fluctuations. Furnish the pilot control system completely factory piped (303 stainless steel) with shut-off cocks to isolate the pilot system on valves 4" and larger. The pressure reducing valve shall be Clayton 90G-01, Charles M. Bailey Company No. 400 or approved equal.
- C. The low flow pressure reducing valve shall be selected to operate at flow rate below the minimum flow rate of the high flow valve and the minimum flow rate indicated in the schedule of the drawings. The low flow pressure reducing valve shall be a spring loaded direct acting globe valve suitable for a working pressure as indicated on the Drawings. The outlet pressure setting shall be field adjustable. The pressure reducing valve shall be Watts #223, or approved equal.
- D. Furnish and install relief valves suitable for the working pressure where required and as indicated on the drawings. Relief valve size shall be as required by the applicable code, and as indicated on the drawings. Domestic cold water pressure reducing assembly relief valve shall have an adjustable range of 20 to 200 psig and shall be Clayton Series 50 with X105 limit switch.

- E. Provide and install pilot operated solenoid valves as detailed on the drawings in the inlet to each pressure reducing valve station. This valve shall close upon activation of the pressure relief valve for its zone. Valve shall be Cla-Val Model 136-01, 120 volt, 60 hertz.

2.04 GAS PRESSURE REGULATORS

- A. Pressure regulating controllers shall be furnished and installed in accordance with Manufacturer's recommendations.
- B. Regulators shall have capacities as scheduled.
- C. Regulators shall be installed and vented in accordance with A.G.A. Bulletin 90.
- D. If it complies with these specifications, one of the following manufacturers will be acceptable: Rockwell or Fisher-Governor.

2.05 GAS SOLENOID VALVES

- A. Provide and install gas solenoid valves in the gas supply and vent piping.
- B. Gas valve shall have aluminum body with Buna "N" diaphragm, and be UL listed for the application.
- C. Valves shall be as manufactured by ASCO or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's written installation instructions, applicable standards, and recognized industry practices.

END OF SECTION

Section 15120

MECHANICAL, VIBRATION ISOLATION

PART 1 - GENERAL

1.01 GENERAL

- A. All provisions of HVAC General Requirements, Section 15000, apply.

1.02 VIBRATION, GENERAL

- A. It is the intent of these specifications that all equipment shall operate without excessive self-destructive vibration, and that any vibration generated shall not be transmitted to other equipment or the building structure.

- B. The contractor shall provide recommended vibration isolation to accomplish this intent.

PART 2 - PRODUCTS

2.01 VIBRATION ISOLATORS APPLICATION

- A. Vibration isolators shall be supplied for the following:
 - 1. Equipment: Air Handling Unit, Floor Unit
 - 2. Vibration Isolator Type: Stable Spring, Un-housed Isolator
 - 3. Remarks: Korfund WSC, Sized for Equipment Point Loads
- B. Catalog designations given are by Korfund; equal equipment by Amber/Booth, Vibration Mounting and Control, or Mason is acceptable.
- C. Selection of size and ratings of vibration isolators shall be made by the vibration isolator supplier based on equipment information supplied by the HVAC Contractor and/or Plumbing Contractor.
- D. Installation shall conform to manufacturer's recommendations.

2.02 VIBRATION ISOLATION PADS

- A. Vibration isolating pads shall be provided at all vibrating equipment in accordance with manufacturer's recommendation and where indicated on the Drawings.

END OF SECTION

Section 15140

MECHANICAL MOTORS AND CONTROLLERS

PART 1 - GENERAL

1.01 GENERAL

- A. All provisions of HVAC General Requirements, Section 15000, apply.

PART 2 - PRODUCTS

2.01 MOTORS, GENERAL

- A. All motor-driven mechanical equipment shall be furnished with motors, factory installed.
- B. Motors shall be suitable for continuous duty in ambient temperature for -30° C to 40° C at the rated service factor.

- C. Motors shall have a service factor of 1.15, minimum.
- D. All motors shall be UL listed.
- E. Motor bearings shall be ball or cylindrical roller bearings, grease lubricated. Bearings shall be selected to provide a L-10 rated life of 30,000 hours with external load factors per NEMA MGI-14.42.

2.02 MOTORS, ENERGY EFFICIENT

- A. Standard NEMA frame motors for equipment so indicated on the drawings shall be classified as “energy efficient” by the manufacturer.
- B. Efficiency data for these motors shall be published by the manufacturer having been determined by testing are in accordance with the latest revision of NEMA MGI-12.53a, IEEE Test Standard, Method B with segregated loss analysis.
- C. Typical minimum efficiencies of three phase energy efficient motors shall be as follows:

	<u>HP</u>	<u>RPM</u>	<u>Efficiency</u>	<u>PF%</u>
1.	3	1,800	88.5	84.0
2.	5	3,600	88.5	92.5
		1,800	87.5	85.0
		1,200	89.5	79.5
3.	7-½	3,600	89.5	88.5
		1,800	90.2	84.0
		1,200	91.0	78.5
4.	10	3,600	89.5	89.5
		1,800	90.2	86.5
		1,200	91.7	79.0
5.	15	3,600	91.0	92.0
		1,800	91.7	83.5
		1,200	91.7	82.0
6.	20	3,600	91.7	93.0
		1,800	92.4	85.0
		1,200	91.7	83.5

2.03 MOTOR CONTROLLERS - GENERAL

- A. HVAC Contractor shall furnish, for all motor driven equipment furnished by them, motor controllers appropriate for the equipment, complying with applicable codes, and complying with these specifications.
- B. All motor control equipment (with exception of variable frequency controllers) furnished by a single sub-contractor shall be of the same manufacturer.
- C. All motor control equipment shall include a normally closed auxiliary contact to control motor winding heaters.

2.04 MOTOR CONTROLLERS - ACROSS-THE-LINE START

- A. Motor controllers (starters) shall be of the NEMA type, not IEC, unless otherwise noted. Overload relays shall be melting alloy type unless otherwise noted.
- B. Motor controller, not automatically controlled, shall have start-stop push buttons in cover and shall have pilot light to indicate starter is energized.
- C. Motor controllers, automatically controlled, shall have H-O-A switch in cover and shall have pilot light to indicate starter is energized.
- D. Starter coils shall operate on 120 VAC. Provide control powered transformer with secondary fuse for starter operating on 460 volts. For starter operating on 208 volt system, line-to-neutral may be used for control; provide control fuse in starter enclosure. Where outside control signal is a voltage signal, furnish interposing relay.

PART 3 - EXECUTION

Not applicable

END OF SECTION

Section 15400

MECHANICAL, HVAC CONTROLS

PART 1 - GENERAL

1.01 GENERAL

- A. All provisions of HVAC General Requirements, Section 15000, apply.

PART 2 - PRODUCTS

2.01 CONTROLS

- A. Provide, for each air conditioning system, a low voltage programmable thermostat, automatic changeover, cooling, heating, fan on auto. Provide single or two stage for heating or cooling as indicated on the Drawings. Thermostats shall be Honeywell chronotherm III or approved equal.
- B. All HVAC control wiring to be in conduit. Electrical Contractor to furnish outlet box and conduit between air handling unit and compressor/condenser unit. Conduit to contain pull wire. HVAC Contractor to install and connect all low voltage wiring.
- C. Coordinate with Electrical Contractor for proper location of boxes and conduit attachment equipment.
- D. Exposed control wiring at units, strapped to piping, or any other location will not be accepted.

E. Control sequence to be as described on the Drawings.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

**SECTION C
BUILDING WAGE SCALE**

A PDF version of this Building Wage Scale can be viewed on the following web link
<https://purchasing.houstontx.gov/buyer/BidDocumentManager.aspx?id=C23781>

**GENERAL CONDITIONS
Document 00700**

A PDF version of the General Conditions can be viewed on the following web link:
<https://purchasing.houstontx.gov/buyer/BidDocumentManager.aspx?id=C23781>

Document 00800

SUPPLEMENTARY CONDITIONS

The following Paragraphs amend and supplement the 2005 edition of General Conditions. Unaltered portions of General Conditions remain in effect.

ARTICLE 3 - THE CONTRACTOR

3.5 *LABOR: Insert the following Paragraph 3.5.3.1.1.*

3.5.3.1.1 Contractor shall make good faith efforts to comply with the City ordinances regarding Minority and Women Business Enterprises (MWBE) and Persons with Disabilities Business Enterprises (PDBE) participation goals which are as follows:

- .1 the MWBE goal is 0 percent, and
- .2 the PDBE goal is 0 percent.

3.28 CONTRACTOR DEBT

3.28.1 IF CONTRACTOR, AT ANY TIME DURING THE TERM OF THIS AGREEMENT, INCURS A DEBT, AS THE WORD IS DEFINED IN SECTION 15-122 OF THE HOUSTON CITY CODE OF ORDINANCES, IT SHALL IMMEDIATELY NOTIFY CITY CONTROLLER IN WRITING. IF CITY CONTROLLER BECOMES AWARE THAT CONTRACTOR HAS INCURRED A DEBT, IT SHALL IMMEDIATELY NOTIFY CONTRACTOR IN WRITING. IF CONTRACTOR DOES NOT PAY THE DEBT WITHIN 30 DAYS OF EITHER SUCH NOTIFICATION, CITY CONTROLLER MAY DEDUCT FUNDS IN AN AMOUNT EQUAL TO THE DEBT FROM ANY PAYMENTS OWED TO CONTRACTOR UNDER THIS AGREEMENT, AND CONTRACTOR WAIVES ANY RECOURSE THEREFORE.

ARTICLE 8 - TIME

8.1 *PROGRESS AND COMPLETION: Delete Paragraph 8.1.6. and replace with the following 8.1.6.*

- 8.1.6.1 Contractor shall credit the City by Change Order for inspection services for overtime work or work performed on Sundays or Legal Holidays. The amount Contractor credits the City will be **\$50.00 per hour** per inspector for inspection services.

ARTICLE 9 - PAYMENTS AND COMPLETION

- 9.1 *UNIT PRICE WORK: Delete Section 9.1 in its entirety and insert the following Section 9.1.*
- 9.1 References to Unit Prices in individual Specification sections are not applicable to the Contract. Include payment for portions of the Work required by these sections in the Stipulated Price for the Contract.
- 9.12 LIQUIDATED DAMAGES: Insert the following Paragraph 9.12.1.1.**
- 9.12.1.1 *The amount of liquidated damages provided in General Conditions Paragraph 9.12.1 payable by Contractor or Surety for each and every day of delay beyond Contract Time, are \$500.00 per day.***

ARTICLE 11 - INSURANCE AND BONDS

- 11.2 *INSURANCE TO BE PROVIDED BY CONTRACTOR: Delete Paragraph 11.2.8. and replace with the following 11.2.8.*
- 11.2.1.4 Contractor shall provide Owners and Contractor's Protective Liability Insurance only if the contractor's bid price is equal to or greater than \$100,000.00.
- 11.2.8 *Endorsement of Primary Insurance:* Each policy except Workers' Compensation Insurance must contain an endorsement that the policy is primary insurance to any other insurance available to additional insured with respect to claims arising under the Contract.

ONE-YEAR MAINTENANCE BOND

THAT WE, _____, as Principal, hereinafter called Contractor, and the other subscriber hereto, _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound to the City of Houston, a municipal corporation, in the sum of \$_____, for the payment of which sum well and truly to be made to the City of Houston and its successors, the said Contractor and Surety do bind themselves, their heirs, executors, administrators, successors, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a Contract in writing with the City of Houston for _____, all of such work to be done as set out in full in said Contract documents therein referred to and adopted by the City Council, all of which are made a part of this instrument as fully and completely as if set out in full herein.

NOW THEREFORE, if the said Contractor shall comply with the provisions of Paragraph 11.5.1 of the General Conditions, and correct work not in accordance with the Contract documents discovered within the established one-year period, then this obligation shall become null and void, and shall be of no further force and effect; otherwise, the same is to remain in full force and effect.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually received or, if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, with proper postage affixed (certified mail, return receipt requested), addressed to the respective other party at the address prescribed in the Contract documents, or at such other address as the receiving party may hereafter prescribe by written notice to the sending party.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the respective dates written below their signatures and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation)

WITNESS: (if not a corporation)

Name of Contractor

By: _____
Name:
Title:

By: _____
Name:
Title:
Date:

ATTEST/SURETY WITNESS:

Full Name of Surety

(SEAL)

Address of Surety for Notice

Telephone Number of Surety

By: _____
Name:
Title:
Date:

By: _____
Name:
Title: Attorney-in-Fact
Date:

This Ordinance or Contract has been reviewed as to form by the undersigned legal assistant and have been found to meet established Legal Department criteria. The Legal Department has not reviewed the content of these documents.

Legal Assistant

Date

PERFORMANCE BOND

THAT WE, _____, as Principal, (the "Contractor"), and the other subscriber hereto, _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound to the City of Houston (the "City"), a municipal corporation, in the penal sum of \$_____ for the payment of which sum, well and truly to be made to the City, its successors and assigns, Contractor and Surety do bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a Contract in writing with the City for _____, _____, all of such work to be done as set out in full in said Contract documents therein referred to and adopted by the City Council, all of which are made a part of this instrument as fully and completely as if set out in full herein.

NOW THEREFORE, if the said Contractor shall faithfully and strictly perform the Contract in all its terms, provisions, and stipulations in accordance with its true meaning and effect, and in accordance with the Contract documents referred to therein and shall comply strictly with each and every provision of the Contract and with this Bond, then this obligation shall become null and void and shall have no further force and effect; otherwise the same is to remain in full force and effect. Should the Contractor fail to faithfully and strictly perform the Contract in all its terms, including but not limited to the indemnifications thereunder, the Surety shall be liable for all damages, losses, expenses and liabilities that the City may suffer in consequence thereof, as more fully set forth herein.

It is further understood and agreed that the Surety does hereby relieve the City or its representatives from the exercise of any diligence whatever in securing compliance on the part of the Contractor with the terms of the Contract, and the Surety agrees that it shall be bound to take notice of and shall be held to have knowledge of all acts or omissions of the Contractor in all matters pertaining to the Contract. The Surety understands and agrees that the provision in the Contract that the City will retain certain amounts due the Contractor until the expiration of 30 days from the acceptance of the Work is intended for the City's benefit, and the City will have the right to pay or withhold such retained amounts or any other amount owing under the Contract without changing or affecting the liability of the Surety hereon in any degree.

It is further expressly agreed by Surety that the City or its representatives are at liberty at any time, without notice to the Surety, to make any change in the Contract documents and in the Work to be done hereunder, as provided in the Contract, and in the terms and conditions thereof, or to make any change in, addition to, or deduction from the Work to be done hereunder; and that such changes, if made, shall not in any way vitiate the obligation in this Bond and undertaking or release the Surety there from.

It is further expressly agreed and understood that the Contractor and Surety will fully indemnify and save harmless the City from any liability, loss, cost, expense, or damage arising

out of Contractor's performance of the Contract.

If the City gives Surety notice of Contractor's default, Surety shall, within 45 days, take one of the following actions:

1. Arrange for Contractor, with consent of the City, to perform and complete the Contract; or
2. Take over and assume completion of the Contract itself, through its agents or through independent contractors, and become entitled to the payment of the balance of the Contract Price.

If the Surety fails to take either of the actions set out above, it shall be deemed to have waived its right to perform and complete the Contract and receive payment of the balance of the Contract Price and the City shall be entitled to enforce any remedies available at law, including but not limited to completing the Contract itself and recovering any cost in excess of the Original Contract Price from the Surety.

This Bond and all obligations created hereunder shall be performable in Harris County, Texas. This Bond is given in compliance with the provisions of Chapter 2253, Texas Government Code, as amended, which is incorporated herein by this reference.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually received or, if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, with proper postage affixed (certified mail, return receipt requested), addressed to the respective other Party at the address prescribed in the Contract documents, or at such other address as the receiving party may hereafter prescribe by written notice to the sending party.

EXECUTED in multiple originals this _____ day of _____, 20_____.

ATTEST/SEAL: (if a corporation)
WITNESS: (if not corporation)

(Name of Principal)

(Address of Principal)

By: _____
Name:
Title:
Date:

By: _____
Name:
Title:
Date:

ATTEST/SEAL
SURETY WITNESS:

(Name of Surety)

(Address of Surety)

By: _____
Name:
Title:
Date:

By: _____
Name:
Title:
Date:

REVIEWED:

This Bond has been reviewed as to form by the undersigned Paralegal and has been found to meet established Legal Department criteria.

Date

Paralegal

STATUTORY PAYMENT BOND

THAT WE, _____, as Principal, hereinafter called Contractor and the other subscriber hereto, _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound unto the City of Houston, a municipal corporation, in the sum of \$_____ for the payment of which sum, well and truly to be made to the City of Houston, and its successors, the said Contractor and Surety do bind themselves, their heirs, executors, administrators, successors, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a contract in writing with the City of Houston for _____, all of such work to be done as set out in full in said Contract documents therein referred to and adopted by the City Council, all of which are made a part of this instrument as fully and completely as if set out in full herein;

NOW, THEREFORE, if the said Contractor shall pay all claimants supplying labor and materials to him or a Subcontractor in the prosecution of the Work provided for in the Contract, then, this obligation shall be void; otherwise the same is to remain in full force and effect;

PROVIDED HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253, Texas Government Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the respective dates written below their signatures and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation)
WITNESS: (if not a corporation)

Name of Contractor

By: _____
Name:
Title:

By: _____
Name:
Title:
Date:

ATTEST/SURETY WITNESS:
(SEAL)

Full Name of Surety

Address of Surety for Notice

Telephone Number of Surety

By: _____
Name:
Title:
Date:

By: _____
Name:
Title: Attorney-in-Fact
Date:

This Ordinance or Contract has been reviewed as to form by the undersigned legal assistant and have been found to meet established Legal Department criteria. The Legal Department has not reviewed the content of these documents.

Legal Assistant

Date