



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

JUDICIAL PURCHASING OFFICE

670 NEW LONDON AVENUE  
CRANSTON, RHODE ISLAND 02920

TEL: 401-275-6527 FAX: 401-275-6530

**BID SOLICITATION INFORMATION**

<b>Date: 11-13-13</b>		<b>RFP/LOI #: B2013019</b>	
<b>Project Name: Air Handler Unit (AHU) Replacement Project (Garrahy Judicial Complex)</b>			
<b>Opening Date, Time and Place: 12/10/13 at 10:30 AM</b> <b>Purchasing, Rm 1006, 670 New London Avenue, Cranston, RI 02920</b>			
<b>Pre-Bid/Proposal Conference:</b> <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes on <b>11/25/2013</b> Time: at <b>7:30 AM</b> <b>***** Mandatory *****</b>			
<b>Location:</b> Garrahy Judicial Complex, One Dorrance Plaza, Providence, RI 02903 Facilities and Operations Office (Entrance via the loading dock door)			
<b>Bonds Required:</b> Surety Bond <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes    Bidder is required to provide a bid surety in the form of a bid bond or certified check payable to the State of Rhode Island in an amount not less than five percent (5%) of the bid price. Fidelity Bond <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Performance Bond <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes The successful bidder will be required to furnish all insurance documentation as outlined in the Judicial Purchasing Rules & Regulations and General Terms & Conditions of Purchase which are available at <a href="http://www.courts.ri.gov">www.courts.ri.gov</a>			
This solicitation is for the supply and installation of two new AHUs (1 & 2) at the Garrahy Judicial Complex. The two new AHUs will replace three existing AHU's identified as AHU#1, AHU# 2 and AHU# 3. This solicitation will also encompass any associated HVAC related improvements at the Garrahy Judicial Complex, located in Providence, RI. This project will include the demolition and removal of AHU#1, AHU# 2 and AHU# 3, and any other associated equipment as noted in the Specifications and Mechanical Drawings in Appendix B contained herein. All solicitation materials will be available upon request.			
<b>Proposals must be mailed or hand-delivered in a sealed envelope marked with the above RFP/LOI# and Project Name to:</b>  Rhode Island Supreme Court Judicial Purchasing Office 670 New London Avenue Cranston, RI 02920			
The bid process and resulting contract are subject to the Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase. Submission of a bid in response to this solicitation is acknowledgement and acceptance of the Judicial Purchasing Rules & Regulations and General Terms & Conditions of Purchase.			
The Administrative Office of State Courts ("AOSC") reserves the right to award on the basis of cost alone, accept or reject any or all bids, and to act in its best interest including, but not limited to, directly negotiating with any vendor who submits a proposal in response to this RFP and to award a contract for collection services based upon the results of those negotiations alone. Proposals found to be technically or substantially nonresponsive at any point in the evaluation process will be rejected and not considered further. The AOSC may, at its sole option, elect to require presentations(s) by bidders clearly in consideration for award.			

Questions concerning this solicitation may be e-mailed to the Supreme Court Purchasing Office at [purchasing@courts.ri.gov](mailto:purchasing@courts.ri.gov) **no later than 11/26/2013, at 10:00 AM**. Please reference the RFP / LOI number on all correspondence. Answers to questions received, if any, will be posted on the internet as an addendum to this bid solicitation.

**Carla Ciccone**  
**Purchasing Agent**  
**Rhode Island Supreme Court**

**THIS PAGE IS NOT A BIDDER CERTIFICATION FORM**

This is a Request for Proposals, not an Invitation for Bid. Responses will be evaluated on the basis of the relative merits of the proposal, in addition to price.

**INSTRUCTIONS AND NOTIFICATIONS TO BIDDERS**

- Potential bidders are advised to review all sections of this Request carefully and to follow instructions completely as failure to make a complete submission as described herein may result in rejection of the proposal.
- All costs associated with developing or submitting a proposal in response to this Request, or to provide oral or written clarification of its content, shall be borne by the bidder. The AOSC assumes no responsibility for these costs.
- Proposals are considered to be irrevocable for a period of not less than sixty (60) days following the opening date, and may not be withdrawn, except with the express written permission of the Judicial Purchasing Committee.
- All pricing submitted will be considered to be firm and fixed unless otherwise indicated herein.
- Proposals misdirected to other judicial locations or which are otherwise not received by the Supreme Court Purchasing Office by the time of opening for any cause, will be deemed late and will not be considered. **For the purposes of this requirement, the official time and date shall be that of the time clock in the Judicial Purchasing Office.**
- It is intended that an award pursuant to this Request will be made to a prime contractor, who will assume responsibility for all aspects of the work. Joint venture and cooperative proposals will not be considered, but subcontracts are permitted, provided that their use is clearly indicated in the bidder's proposal, and the subcontractor(s) proposed to be used are identified in the proposal.
- Bidders are advised that all materials submitted to the AOSC for consideration in response to this Request for Proposals shall be considered to be public records as defined in Title 38 Chapter 2 of the Rhode Island General Laws, without exception, and may be released for inspection immediately upon request once an award has been made.



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

JUDICIAL PURCHASING OFFICE  
250 BENEFIT STREET - ROOM 418  
PROVIDENCE, RHODE ISLAND 02903  
TEL: 401-222-8655  
FAX: 401-222-8864

**BID / RFP SPECIFICATION SHEET**

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Pursuant to Article X ("Methods of Source Selection") of the Judicial Purchasing Rules and Regulations, attached are the bid/ request for proposal specifications for the following project

Project Name: **Air Handler Unit (AHU) Replacement Project (Garrahy Judicial Complex)**

Project Number: **B2013019**

Prepared by: **Carla Ciccone – Purchasing Agent**

***All bids and/or proposal specifications are subject to and governed by the Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase.***

**Contents:**

- 1.0 Overview**
- 2.0 Scope of Work**
- 3.0 Proposal Content and Organization**
- 4.0 Acknowledgment of Risk and Hold Harmless Agreement**
- 5.0 Additional Insurance Requirements**
- 6.0 Evaluation Criteria**
- 7.0 Bid Form**
  
- Appendix A BCI Authorization and Disclaimer Form**
- Appendix B Mechanical and Electrical Drawings**
- Appendix C Rhode Island Judiciary General Terms and Conditions of Purchase**

## **1.0 Overview**

The Administrative Office of State Courts (“AOSC”) is seeking a company (“Contractor” or “Vendor”) to provide and install two new AHUs (designated AHU #1 & AHU #2) at the Garrahy Judicial Complex. The new AHUs will replace three existing pieces of equipment, AHU #1, AHU #2 and AHU #3 and any other related HVAC pieces of equipment on the first floor at the Garrahy Judicial Complex, located at One Dorrance Plaza, Providence, RI. This project will include the demolition and removal of the existing AHUs identified as 1, 2 and 3 as noted in the Specifications and Drawings located in Appendix B. The AOSC is requesting that the pricing proposal be submitted as a base bid with alternates for “Quick Ship” options.

## **2.0 Scope of Work**

### General Qualifications

The Contractor must comply with all applicable licensing and permitting requirements for this type of service. A copy of all required local, state and/or federal (if applicable) license(s) or permit(s) must be submitted with the RFP response. Submission of a bid is acknowledgement that any and all work performed in relation to this bid will be performed by personnel holding the required valid local, state and/or federal license(s) and/or permit(s).

Any and all license and permit fees shall be paid by the Contractor.

If at any time, the Rhode Island Department of Labor, Division of Occupational Safety determines that the work performed by the Contractor does not comply with Rhode Island Law and/or applicable safety regulations, the Contractor shall correct the work to insure compliance at no additional cost to the AOSC.

Contractors must demonstrate they have experience installing the equipment requested.

### Inspection Requirements

Bidders are responsible for inspecting the equipment and/or location, taking measurements when required, and familiarizing themselves with the totality of requirements associated with this project before submitting a bid.

Measurements provided with any bid are for reference purposes only and are not guaranteed to be completely accurate.

### Safety

Safety measures shall be maintained by the Contractor while working on-site for the duration of this project. All Federal, State, OSHA and local safety codes must be followed at all times.

### Pre-Bid Conference

There will be a mandatory pre-bidder’s conference to view the area where the AHU units will be installed. The pre-bid conference will give bidders the opportunity to familiarize themselves with the work site and ask any questions they may have.

The AOSC will not be obligated to schedule site visits after the pre-bid conference.

No claims for extra costs will be allowed due to lack of knowledge concerning verifiable conditions.

### Time Frame

All work must be performed continuously until the project is complete. The Contractor must be prepared to devote adequate labor and materials to complete the project in a timely manner without delays.

Upon completion, the project will be inspected and accepted by AOSC staff, or an appropriate designee.

### Location

The location to be serviced under this contract:

Garrahy Judicial Complex  
One Dorrance Plaza  
Providence, RI 02903

### Project Plan

**A Project Plan must be submitted along with the Bid Form at time of bid submission.**

The Project Plan must outline the steps the bidder will take to accomplish this project and must reflect how the vendor will implement the following plan.

The approved vendor will have 84 hours starting on Thursday March 6, 2014 at 4:30pm until Monday March 10, 2014 at 4:30am to complete the demo of the old AHUs and any other related equipment and have the new AHUs and any associated equipment operational to such a degree that they are maintaining the proper temperature and air flow in all areas associated with the new AHUs 1 & 2.

Any and all openings that are made in the building envelope for the project will never be left unsecured and or unattended.

All outside vendors must have a clear and distinct means of identifying them as the workers associated with the project, preferably fluorescent shirts with their respective company logo on it.

### Demolition

This project includes the demolition and removal of the existing AHUs and any other associated equipment as noted in the Specifications and Drawings in Appendix B. All demolition must be performed in a safe manner. All debris must be disposed of off site and is the sole responsibility of the Contractor.

The Contractor shall leave all work areas clean and free of debris at the end of each day of work. AOSC personnel will be on hand to spot check these areas.

### Installation

#### *General Requirements*

Throughout this project the Contractor will maintain a clean, safe and acceptable environment. The Contractor will be responsible for removing and properly disposing of all debris from the demolition and construction areas off site on a daily basis.

During the construction timeline, the Courts will be in regular operation. No aspect of the Courts operations can be impeded during the process, unless written notification has been given by the AOSC. A clean environment must be maintained at all time during construction.

During this project the Contractor must work with representatives from the AOSC's Facilities and Operations Department to ensure that all building codes and RFP requirements are being met. This individual will be named at time of award.

### Fire Safety

After the award but prior to the start of the physical project the Vendor will meet with the AOSC's Facilities and Operations Fire and Safety representative to assure adherence to all policies

### Smoke Detectors

It will be the responsibility of the Contractor to eliminate any false or real alarms due to smoke detection.

### Hot Work Permits

Hot Work Permits are required to be filled out prior to the shift and at the end of the shift. These permits are required for any work producing sparks, torches, soldering etc. All hot work will be required to stop one (1) hour prior to the end of that shift with a dedicated fire watch with the appropriate equipment for each area of work.

### Work Times

During the project the schedule for work other than the actual shut-down is between 4:30pm – 12:00am. Any deviation from the normal working hours as well as all deliveries and/or removal of materials must be coordinated with the AOSC's Facilities and Operations designated contact person. This person will be named at time of award.

### Charges

Charges for parking, travel, mileage, portal to portal, and other miscellaneous charges will not be covered under the contract.

### Waste Removal

All waste oil (or any other type of contaminants) generated during this installation must be removed and disposed of off site. The disposal must be in compliance with all Municipal, State and Federal laws and regulations. All costs will be the responsibility of the contractor.

### Warranty

The contractor must offer a warranty of one (1) year, covering all maintenance and repairs commencing of the date of acceptance.

The warranty must include 24 hour / 7 day call back and must include monthly inspections, examinations and reports.

### Security

During this contract, security measures will be in place at all court locations. The Vendor, its officers, agents, servants and employees shall comply with all security measures in place at each courthouse location, including processing through metal detectors, background checks, and signing the vendor log book at each courthouse upon entry. It is the Vendor's responsibility to inquire with the AOSC's Director of Security as to what security measures apply to the services to be provided under a contract awarded pursuant to this RFP and to advise its officers, agents, servants and employees accordingly. There will be no exceptions.

Upon award the Vendor shall provide the AOSC's Director of Security with complete, notarized BCI Authorization and Disclaimer forms (Appendix A) for all of its officers, agents, servants and employees who may provide services pursuant to this RFP ("Personnel"). The forms must be accompanied by copies of a valid driver's license and any other personal identifying information requested by the AOSC, such as date of birth and/or social security number. All Personnel must be cleared by the AOSC Security Personnel before performing any services under a contract awarded pursuant to this RFP. Personnel who are not on the list shall not, under any

circumstances, be sent to perform such services. It will be the responsibility of the Vendor to immediately inform the AOSC's Director of Security of any personnel changes.

All Courthouse deliveries and/or removal of materials will be completed by 8:00 AM Monday through Friday. If there is a need to deliver materials outside the designated times, these deliveries must be coordinated with the Facilities and Operations assigned project manager for this project. This individual will be named at time of award. Packages will be inspected upon delivery.

No parking will be provided to the Contractor by the AOSC except limited temporary parking for the delivery and pick up of supplies.

#### Scope of Work

Refer to Drawings in Appendix B.

### **3.0 Proposal Content and Organization**

Pricing must include all costs as specified in Section 2.0 – Scope of Work. Pricing for this proposal must be indicated on the Bid Form in Section 8.0 and **must be submitted in a separate, sealed envelope marked with the words "Pricing Proposal"**. Only one pricing proposal needs to be submitted. All Bid Forms must be signed.

Vendors must include on the Bid Form a list of at least four (4) references with whom they have contracted to do similar work by including the company name, telephone number, and a contact person.

Respondents must also include an overview of their company's experience including, but not limited to, the number of years the company has been providing these services, the size of the company (including the number of employees and locations), a description of past work undertaken that is similar to what is being requested in this RFP, and certifications that show a knowledge of equipment that would be serviced under this contract.

Five (5) copies of your proposal must be submitted at the time of submission. Proposals must be in the following format:

Bid Form (minus the pricing proposal)

Company overview

License/permits required

Submission of a proposal is acknowledgement and acceptance of the Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase.

### **4.0 Acknowledgment of Risk and Hold Harmless Agreement**

In addition to the indemnity provisions in the Judicial Terms and Conditions of Purchase, the Vendor, its officers, agents, servants, employees, parents, subsidiaries, partners, officers, directors, attorneys, insurers, and/or affiliates (Releasors) agree to release, waive, discharge and covenant not to sue the AOSC, its officers, agents, servants or employees (Releasees) from any and all liability, claims, cross-claims, rights in law or in equity, agreements, promises demands, actions and causes of action whatsoever arising out of or related to any loss, damage, expenses (including without limitation, all legal fees, expenses, interest and penalties) or injury (including death), of any type, kind or nature whatsoever, whether based in contract, tort, warranty, or other legal, statutory, or equitable theory of recovery, which relate to or arise out of a contract awarded pursuant to this RFP and the Releasors use of or presence in and/or on judicial property. The Releasors agree to defend, indemnify and hold harmless the Releasees from (a) any and all claims, loss, liability, damages or costs by any person, firm, corporation or other entity claiming

by, through or under Releasors in any capacity whatsoever, including all subrogation claims and/or claims for reimbursement, including any court costs and attorneys fees, that may incur as a result of a contract awarded pursuant to this RFP or due to Releasors use of or presence in and on judicial property; and (b) any and all legal actions, including third-party actions, cross-actions, and/or claims for contribution and/or indemnity with respect to any claims by any other persons, entities, parties, which relate to or arise out of a contract awarded pursuant to this RFP or Releasors use of or presence in and on judicial property.

The Releasors acknowledge the risks that may be involved and hazards connected with use of or presence in and on judicial property but elect to provide services under any contract with the AOSC with full knowledge of such risks. Releasors also acknowledge that any loss, damage, and/or injury sustained by Releasors is not covered by Releasees insurance. Releasors agree to become fully aware of any safety risks involved with the performance of services under any contract with the AOSC and any safety precautions that need to be followed and agree to take all such precautions.

The duty to indemnify and/or hold harmless the AOSC shall not be limited by the insurance required under the Judicial Terms and Conditions of Purchase.

## **5.0 Additional Insurance Requirements**

In addition to the insurance provisions in the Judicial Terms and Conditions of Purchase, the liability insurance coverage, except Professional Liability, Errors and Omissions or Workers' Compensation insurance required for performance of a contract with the AOSC shall include the AOSC, its divisions, officers and employees as Additional Insureds but only with respect to the Vendor's activities under the contract. The insurance required through a policy or endorsement shall include:

- a. a Waiver of Subrogation waiving any right to recovery the insurance company may have against the AOSC; and
- b. a provision that the Vendor's insurance coverage shall be primary with respect to any insurance, self insurance or self retention maintained by the State on behalf of the AOSC and that any insurance, self insurance or self retention maintained by the State on behalf of the AOSC shall be in excess of the Vendor's insurance and shall not contribute.

There shall be no cancellation, material change, potential exhaustion of aggregate limits or non-renewal without thirty (30) days written notice from the Vendor or its insurer(s) to the Judiciary's Purchasing Agent. Any failure to comply with the reporting provision of this clause shall be grounds for immediate termination of the contract with the AOSC.

Insurance coverage required under the contract shall be obtained from insurance companies acceptable to the AOSC. The Vendor shall pay for all deductibles, self insured retentions and/or self insurance included hereunder.

The Judiciary's Purchasing Agent reserves the right to consider and accept alternative forms and plans of insurance or to require additional or more extensive coverage for any individual requirement.

## **6.0 Evaluation Criteria**

The AOSC reserves the right to award on the basis of cost alone, accept or reject any or all proposals, and to otherwise act in its best interest including, but not limited to, directly negotiating with any Supplier who submits a proposal in response to this RFP and to award a contract for these services based upon the results of those negotiations alone.

Proposals found to be technically or substantially non-responsive at any point in the evaluation process will be rejected and not considered further. The AOSC may elect to require presentations(s) by vendors in consideration for award.

Proposals will be evaluated in two (2) phases:

1. The first phase is an initial review to determine if the proposal, as submitted, is complete. To be complete, a proposal must meet all the requirements of this RFP.
2. The second phase is an in-depth analysis and review based on criteria below and their associated weights.

<b><u>Evaluation Criteria</u></b>	<b><u>Importance</u></b>
Ability to Meet Specifications	25%
Price	35%
Experience	40%

**7.0 Bid form**

Project: **B2013019 – Air Handler Unit (AHU) Replacement Project (Garrahy Judicial Complex)**

Date: \_\_\_\_\_

Submitted By: \_\_\_\_\_

(Include Name, Address and Telephone No.) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Will any of the work spelled out in this bid be outsourced? \_\_\_\_ Yes \_\_\_\_ No

If so, please explain below:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

General Information

Have you or your firm been subject to suspension, debarment or criminal conviction by the AOSC, the Judiciary, the State of Rhode Island, or any other jurisdiction?

Yes: \_\_\_\_\_ No: \_\_\_\_\_

Has the AOSC, the Judiciary and/or the State of Rhode Island ever terminated contracts with your firm for cause?

Yes: \_\_\_\_\_ No: \_\_\_\_\_

Has your firm ever withdrawn from a contract with the AOSC, the Judiciary and/or the State of Rhode Island during its performance?

Yes: \_\_\_\_\_ No: \_\_\_\_\_

Have you or your firm been involved in litigation against the AOSC, the Judiciary and/or the State of Rhode Island.

Yes: \_\_\_\_\_ No: \_\_\_\_\_

If you answered yes to any of the foregoing, please explain the circumstances below. If you or your firm has been involved in litigation against the AOSC, the Judiciary and/or the State of Rhode Island, please include the case caption, case number and status. (If more space is needed, please attach separate sheet and submit with the bid.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Is your company bonded?      Yes \_\_\_\_      No \_\_\_\_

Please describe the nature and extent of all insurance coverage:

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Addenda

The following Addenda have been received. The noted modifications to the Bidding Documents have been considered and all costs are included in the Bid Sum.

Addendum #1, Dated: \_\_\_\_\_

Addendum #2, Dated: \_\_\_\_\_

Addendum #3, Dated: \_\_\_\_\_

References

Please list at least four (4) companies with whom you have contracted to provide similar services:

Reference #1  
Company Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Contract Dates: \_\_\_\_\_ To \_\_\_\_\_

Reference # 2  
Company Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Contract Dates: \_\_\_\_\_ To \_\_\_\_\_

Reference # 3  
Company Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Contract Dates: \_\_\_\_\_ To \_\_\_\_\_

Reference # 4  
Company Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Contract Dates: \_\_\_\_\_ To \_\_\_\_\_



**Did you remember to:**

**Initial Here**

- 1. Place the pricing proposal in a separate sealed envelope marked "Pricing Proposal"? \_\_\_\_\_
- 2. Prepare four (4) separate copies of your bid response (NOT including the Pricing Proposal) for submission? \_\_\_\_\_

## Pricing

Having examined bid # B2013019, we propose to enter into a contract with the AOSC to supply the services as per the bid specifications for the costs listed below:

Only one pricing proposal needs to be submitted in a separate, sealed envelope.

\$				,				,				.		
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Numeric

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Written

### Bid Form Signature

\_\_\_\_\_

(Bidder Name – Please Print)

By: \_\_\_\_\_

(Signature)

Title: \_\_\_\_\_ Company: \_\_\_\_\_

Email Address: \_\_\_\_\_

**Appendix A**

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
ADMINISTRATIVE OFFICE OF STATE COURTS**

250 BENEFIT STREET

PROVIDENCE, RHODE ISLAND 02903

TEL: 401-222-6700

FAX: 401-222-4740



**CRIMINAL BACKGROUND INVESTIGATION AUTHORIZATION, RELEASE AND DISCLAIMER**

I, \_\_\_\_\_, hereby direct and authorize the Bureau of Criminal Identification of the Department of Attorney General for the State of Rhode Island to make available to the Rhode Island Administrative Office of State Courts any criminal record that the Bureau of Criminal Identification has on file in reference to me, and I further consent to the authentication of my identity through fingerprinting, or some other process that may be required to confirm my identity.

I understand that an investigative report may be generated on me that may include information as to my criminal history records from any criminal justice agency in any or all federal, state, city and county jurisdictions, including any state Department of Motor Vehicle/Drivers' License Records, traffic citations and/or registrations.

I hereby waive and release any and all manner of actions, cause of actions, and demands of every kind, nature and description, arising from any release of criminal records and requests therefrom, whatsoever against the State of Rhode Island, the Rhode Island Administrative Office of State Courts, the Bureau of Criminal Identification, the Attorney General, and the employees of the Attorney General's Office, in both law and equity which I may now have or that may arise in the future.

\_\_\_\_\_  
Employee Name (Please Print)

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Maiden Name (If Applicable)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date of Birth

\_\_\_\_\_  
Employer/Company Name (If applicable)

\_\_\_\_\_  
Place of Birth

\_\_\_\_\_  
Social Security Number

Sworn to before me in the City/Town of \_\_\_\_\_, State of Rhode Island, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Commission expires on \_\_\_\_\_.

\_\_\_\_\_  
Notary Public (Print Name)

\_\_\_\_\_  
Notary Public (Signature)

Project Name: \_\_\_\_\_

Project # \_\_\_\_\_ Date of Bid/RFP Specifications \_\_\_\_\_

**Copy of valid photo identification with date of birth must be attached to all BCI Authorization Forms.** BCI 08/08

## **Appendix B**

Drawings covering the following is supplied to each bidder on CD for :

Mechanical Demolition

Mechanical New Work





AIR HANDLING UNIT SCHEDULE																																				
TAG NO.	SERVING	CFM	OA CFM	SUPPLY FAN										CHILLED WATER COIL										HOT WATER COIL										WEIGHT (LBS)	MANUFACTURER MODEL NUMBER	REMARKS
				CFM	ESP (IN WC)	MOTOR HP	MCA	MOP	V	PH	HZ	COOL TOTAL MBH	COOL SENS MBH	GPM	ROWS	EWT (°F)	LWT (°F)	EAT (°F)	LAT (°F)	WPD (FT)	APD (FT)	HEAT TOTAL MBH	GPM	ROWS	EWT (°F)	LWT (°F)	EAT (°F)	LAT (°F)	WPD (FT)	APD (FT)						
G-AHU-3	2ND & 3RD FLR WEST	23,000	3,000	23,000	2.5	25	37.5	70	480	3	60	888.21	633.83	180	4	45	55	80	67	55	54	9.83	0.541	997.74	100	2	140	120	55	95	4.70	0.157	6400	TRANE PERFORMANCE CLIMATE CHANGER SIZE 50	SEE NOTES	
G-AHU-1,2	PRISONER / PUBLIC DEFENDERS	12,000	3,000	12,000	2.0	15	23.13	45	480	3	60	465.81	330.7	95	4	45	55	80	67	55	54	15.92	0.547	NOT USED										2700	TRANE PERFORMANCE CLIMATE CHANGER SIZE 25	SEE NOTES

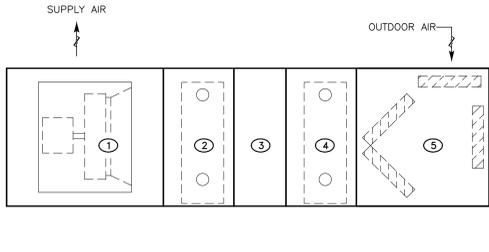
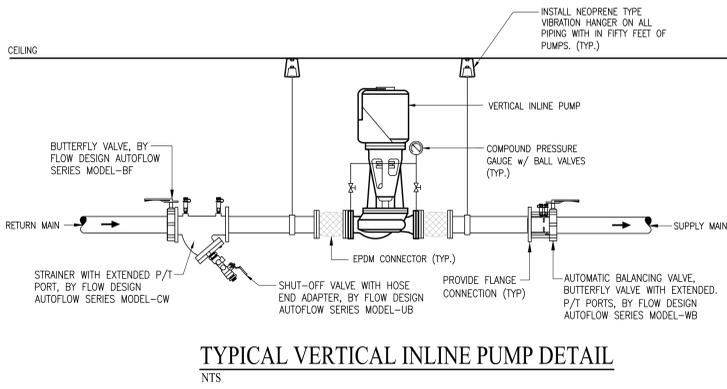
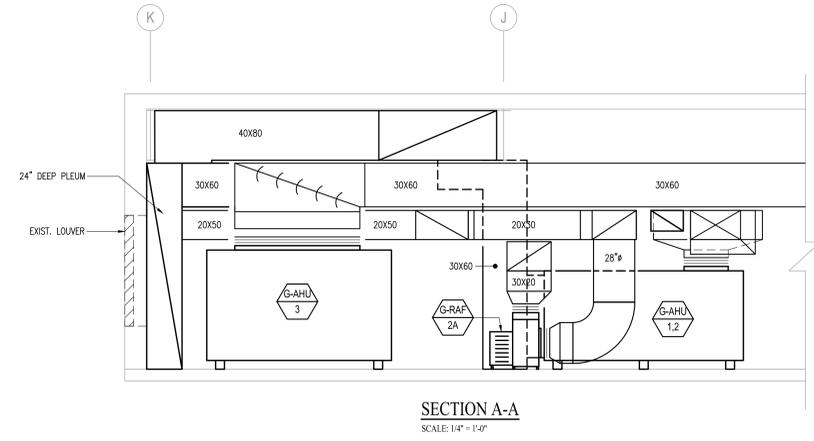
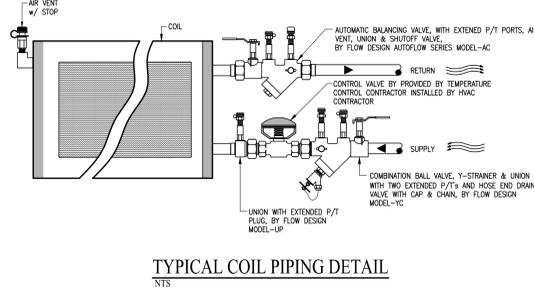
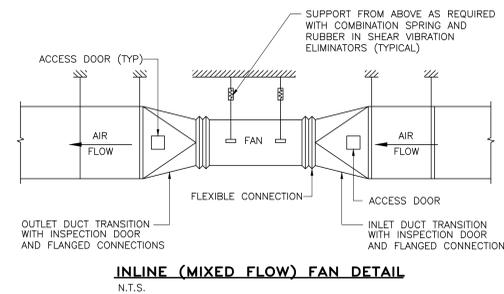
HEATING COIL SCHEDULE																		
TAG NO.	AREA SERVING	SIZE		AIRSIDE				WATER SIDE				FIN TYPE	COIL TYPE	MANUFACTURER MODEL NUMBER	REMARKS			
		WIDTH	HEIGHT	CFM	VEL.	APD (FT)	EDBF	LDBF	MBH	GPM	ROWS					EWT (°F)	LWT (°F)	WPD (FT)
G-HC-1	PRISONER	44	30	6,200	650	0.304	55	95	270	30	2	140	120	1.2	PRIMA-FLO H	AI (135 FIN / FT)	TRANE MODEL No. 5W	-
G-HC-2	PUBLIC DEFENDERS	44	30	6,000	650	0.304	55	95	260	30	2	140	120	1.2	PRIMA-FLO H	AI (135 FIN / FT)	TRANE MODEL No. 5W	-

FAN SCHEDULE														
TAG NO.	SERVING	FAN TYPE	CFM	ESP (IN WC)	SPEED (RPM)		DRIVE	ELECTRICAL DATA				MANUFACTURER MODEL NUMBER	REMARKS	
					FAN	MOTOR		HP	V	PH	HZ			
G-RAF-1	G-AHU-3	INLINE	23,000	1.5	1163	1170	DIRECT	15	460	3	60	GREENHECK MODEL No. QEID-36-55-B150	SEE NOTES	
G-RAF-2A	G-AHU-1,2	CENTR.	6,200	1.5	867	1725	DIRECT	5	460	3	60	GREENHECK MODEL No. SFB-18-50	SEE NOTES	
G-RAF-2B	G-AHU-1,2	CENTR.	6,000	1.5	858	1725	DIRECT	5	460	3	60	GREENHECK MODEL No. SFB-18-50	SEE NOTES	

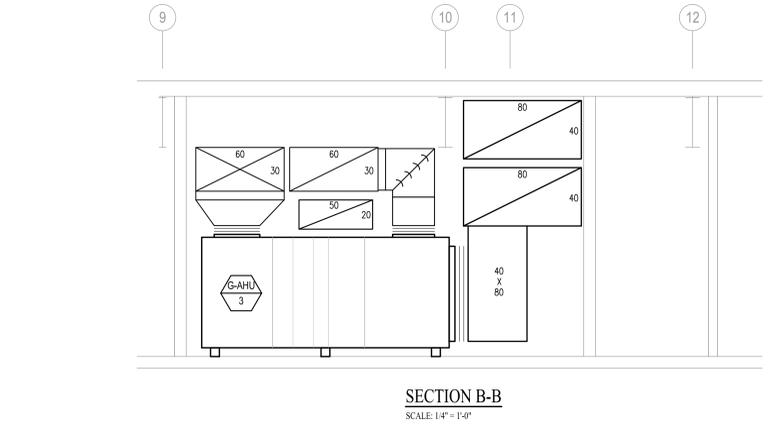
PUMP SCHEDULE														
TAG NO.	LOCATION	TYPE	GPM	HEAD (FT.)	FLUID TEMP. °F	RPM	ELECTRICAL DATA				MANUFACTURER MODEL NUMBER	REMARKS		
							MOTOR HP	V	PH	HZ				
G-P-1	1ST FLOOR MEC RM	INLINE	160	40	140	1760	5	480	3	60	TACO MODEL No. KV2009	SEE NOTES		

DUCT CONSTRUCTION DETAIL														
DIMENSION OF LONGEST SIDE - INCHES	SHEET METAL GAGE (ALL FOUR SIDES)	MINIMUM REINFORCING ANGLE SIZE & MAXIMUM LONGITUDINAL SPACING BETWEEN TRANSVERSE JOINTS &/OR INTERMEDIATE												
		MIN. DIM. IN.	DRIVE SLIP	PLAIN "S" SLIP	HEMMED "S" SLIP	ALTERNATE BAR SLIP	REINFORCED BAR SLIP	BAR SLIP	ANGLE SLIP	STAND. SEAM	ANGLE REINFORCED STAND. SEAM	POCKET LOCK	ANGLE REINFORCED POCKET LOCK	
UP THRU 12	26	NONE REQ.	1	26	26	24	24	24	24	24	NOT REQ.	NOT REQ.	24	NOT REQ.
13 - 18	24	NONE REQ.	1	24	24	24	24	24	24	24	NOT REQ.	NOT REQ.	24	NOT REQ.
19 - 30	24	1X1 1/2 @ 60"	1	-	24	24	24	24	24	24	NOT REQ.	NOT REQ.	24	NOT REQ.
31 - 42	22	1X1 1/2 @ 60"	1	-	-	22	22	22	22	22	NOT REQ.	NOT REQ.	22	NOT REQ.
43 - 54	22	1 1/2 X 1 1/2 @ 60"	1 1/2	-	-	22	22	22	22	22	1 1/2 X 1 1/2	NOT REQ.	22	NOT REQ.
55 - 60	20	1 1/2 X 1 1/2 @ 60"	1 1/2	-	-	-	22	22	22	22	1 1/2 X 1 1/2	NOT REQ.	22	NOT REQ.
61 - 84	20	1 1/2 X 1 1/2 @ 30"	1 1/2	-	-	-	22	22	22	22	1 1/2 X 1 1/2	NOT REQ.	22	NOT REQ.

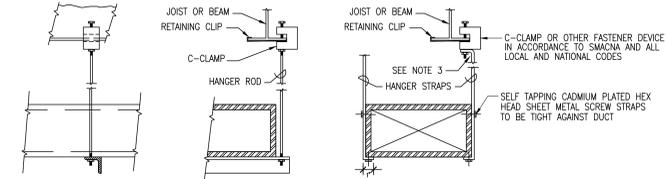
TRANSVERSE REINFORCING SIZE IS DETERMINED BY DIMENSION OF SIDE TO WHICH ANGLE IS APPLIED



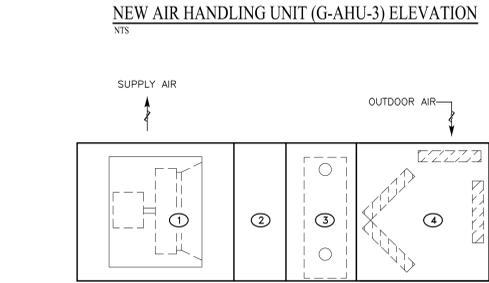
- 1. PLENUM SUPPLY FAN (23,000CFM @ 2.5"ESP) (RPM LESS THAN 1200RPM) (W/ VFD)
- 2. CHILLED WATER COIL
- 3. HOT WATER COIL
- 4. ACCESS SECTION
- 5. FILTER / MIX BOX



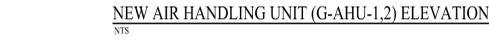
HANGER SIZES FOR RECTANGULAR DUCT			
MAX SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
30"	1" x 18 GA. STRAP	NONE REQUIRED	10'-0"
36"	1/4" ROUND ROD	1-1/2"x1-1/2"x1/8"	8'-0"
48"	1/4" ROUND ROD	2" x 2" x 1/8"	8'-0"
60"	5/16" ROUND ROD	2" x 2" x 1/8"	8'-0"
84"	3/8" ROUND ROD	2" x 2" x 1/8"	8'-0"



- 1. ALL SUPPLY AIR DUCT SHALL BE WRAPPED EXTERNALLY AS SPECIFIED.
- 2. NO POP RIVETS ALLOWED.
- 3. PREVENT BENDING OF STRAP AT 90° BEND UNDER LOAD.



- 1. PLENUM SUPPLY FAN (12,000CFM @ 2.0"ESP) (RPM LESS THAN 1200RPM) (W/ VFD)
- 2. ACCESS SECTION
- 3. CHILLED WATER COIL
- 4. FILTER / MIX BOX



**AIR HANDLING UNIT REPLACEMENT PROJECT**  
J. JOSEPH GARRAHY  
JUDICIAL COMPLEX  
ONE DORRANCE PLAZA  
PROVIDENCE, RI 02903

ISSUED FOR CONSTRUCTION

SCHEDULES & DETAILS HVAC

Project No: 20130125  
Drawn By: JPS  
Checked By: RCN  
Scale: AS NOTED  
Date: 10.23.2013

M-2  
CEC # 20130125



SECTION 15000

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15700	Liquid Heat Transfer
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15900	Controls and Instrumentation
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16100	Electrical

SECTION 15010

GENERAL PROVISIONS FOR MECHANICAL WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Drawings and General Provisions of Contract, including General and Modifications to General Conditions and Division 1 Specification Sections, apply to work specified in this Section.

1.02 DESCRIPTION

- A. All items covered in this Section apply to all other 15000 Sections.

1.03 QUALITY ASSURANCE

- A. All work shall be done by licensed contractors in their dedicated trade.
- B. Welding shall be done by certified welders.
- C. Piping shall be fabricated by a qualified licensed plumber and/or steamfitters.
- D. During the progress of the work, there shall be a person present at all times who has a minimum of five years' direct experience in the work being done.

1.04 SUBMITTALS

- A. Submit copies for approval and record of:
  - 1. All Tests.
  - 2. Balancing Report.
  - 3. Maintenance Manuals.
- C. Any additional cost or loss, or damage arising from the substitution of any material or method for those originally specified shall be borne by the Contractor, notwithstanding review or acceptance of such substitution by the owner, unless the substitution was made at the written request of the Owner. Any cost for re-design of any components of the contract documents shall be borne by the Contractor, unless the substitution was made at the written request of the Owner.

1.05 SCOPE OF WORK

- A. Provide all labor, materials, equipment, controls and accessories necessary to complete the work shown on the Drawings or herein specified.
- B. The work to be done under this Division includes all related work shown on the Drawings.

1.06 MATERIALS

- A. Any device, material or construction required to complete the job that is not specifically covered by description herein shall be of commercial-grade material normally used for the purpose and installed in a manner consistent with the conditions of use. Items exposed to the elements shall be weatherproofed or protected. All such items shall be submitted for review before being purchased or installed.

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### 1.07 CODES AND STANDARDS

- A. Materials and equipment shall be designed, constructed, installed and tested in accordance with this Specification and the latest editions of the following applicable standards in addition to state and local codes applying. All products shall bear the label of approval from the appropriate agency.

National Environmental System Contractors Assoc.	NESCA
Air Moving and Conditioning Association	AMCA
American Society of Heating, Refrigerating and Air Conditioning Engineers	ASHRAE
American Society of Mechanical Engineers	ASME
Federal Construction Safety Standards (U.S. Dept. of Labor)	FCSS
American Society of Testing Materials	ASTM
National Electric Code	NEC
National Electrical Manufacturers Association	NEMA
National Fire Code	NFC
Occupational Safety and Health Act of '70	OSHA
Building Officials Conference of America	BOCA
National Sanitation Foundation	NSF
Air Conditioning and Refrigeration Inst.	ARI
Underwriters Laboratories, Inc.	UL

- B. Any materials or workmanship called for in the above-mentioned requirements which are not specified or shown on the Drawings, shall be furnished and installed by the Contractors as though same had been specifically mentioned or indicated.
- C. If these Contractors fail to notify the ENGINEER at this time, and install work in variance with the above-mentioned codes and regulations, they shall assume responsibility and expense to rectify the installation to the satisfaction of the ENGINEER and Owner.
- D. Secure all local, state and federal permits necessary in connection with the installation of the equipment, including licenses and approvals and pay fees required for same.
- E. All work shall be performed in strict accordance with the above-mentioned standards, local and state codes.
- F. File all necessary Plans and Documents with Local Authorities and obtain the necessary Certificates of Inspection for work. Deliver same to ENGINEER prior to request for acceptance and final payment.
- G. Notify ENGINEER of any deviation from codes of work indicated or herein specified before installation of work is affected.

### 1.08 DEFINITIONS

- A. "Contractor" means specifically sub-contractor working under his respective Section of the Specifications.
- B. "Furnish" and "Provide" mean to supply, erect, install and connect up complete in readiness for regular operation, particular work referred to, unless otherwise specified.
- C. "Piping" includes, in addition to pipe, all fittings, valves, hangers and other accessories relating to such piping.

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- D. "Ductwork" includes, in addition to ducts, all fittings, hangers, dampers, elbows, transitions, access panels, breaker strips, flexible connections and other accessories relating to ductwork.
- E. "Concealed" means hidden from view, in chases, walls or underground.
- F. "Exposed" means not installed underground or concealed as defined above.
- G. "Supply" means purchase and delivery of material to the site.
- H. "Install" means to erect in place the supplied item.

### 1.09 WORK PROCEDURE

- A. The Contractor shall, in good workmanlike manner, perform all work and furnish all supplies and materials, machinery, equipment and means, herein and otherwise specified, necessary or proper to perform and complete all work required by the Plans and Specifications in order to have a complete and satisfactory installation acceptable to the ENGINEER.

### 1.10 COOPERATION WITH OTHER TRADES

- A. Cooperate to fullest extent with all other trades to best expedite the entire work.
- B. Furnish all information pertaining to materials, sizes, locations, means of support, etc., to all other trades requiring such information.
- C. Where work of Contractor will be installed in close proximity to work of other trades, or where there is evidence that work of Contractor will interfere with work of other trades, he shall assist in working out space conditions to make satisfactory adjustment. Interference with work of other trades shall be remedied without extra charge.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. All products shall be new and without defects.
- B. Products required by construction but not specifically described herein shall be as selected by the Contractor subject to the approval of the ENGINEER.

### 2.02 ACCESS DOORS

- A. UL fire rated units with steel hinged door and lock. Rating shall match construction in which they are installed.

### 2.03 PIPE HANGERS AND SUPPORTS

- A. Clevis type hangers, Grinnell, Fig. 260, shall be used except as otherwise noted in Section 15050 - Vibration Isolation and Seismic Restraint. Support pipes four inches and over with Grinnell, Figure 181 or 171 adj., pipe roll with pipe covering protection saddle.
- B. Perforated band iron, wire, chain or other piping shall not be used as supports nor shall hanger rods pierce ductwork.
- C. Vertical piping supports shall be provided where required, equal to Grinnell steel extension pipe clamps, Figure 261, or Somerville Manufacture.
- D. Use copperized equipment on copper pipe and PVC coated for PVC pipe.

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- E. Chilled water and Dual Temperature piping support shall be outside the pipe insulation. Use insulation protection saddles for each support; size shall be as per manufacturer's recommendation for each size and service of pipe.

### 2.04 UNIONS

- A. Use dielectric unions or flanges to connect dissimilar metal parts.

### 2.05 MOTORS AND STARTERS

- A. All motors shall be rated at 85% power factor at full rated load. Motors less than 85% power factor shall be corrected to 90% power factor at the factory. All motors shall be rated premium efficiency. Motors used with variable frequency drives shall be rated for inverter duty.
- B. Starters shall be Cutler Hammer or equal, with pushbuttons, HOA switches, auxiliary contacts, etc. Furnish starters for motors ½ HP and over and as required by sequence of operation in Section 15900. Starters for motors 200 V/3 phase and over, use products with built-in, 120-volt control circuit transformer. This Contractor shall supply all starters unless specifically shown or specified elsewhere. Division 16 will install starters.
- C. Disconnects provided by this contractor will be installed by Division 16, with the exception of factory mounted disconnects.

### 2.06 PIPE LINE IDENTIFICATION

- A. Use ANSI approved color bands and direction arrows with identification lettering.

### 2.07 EQUIPMENT IDENTIFICATION

- A. Use black laminated phenolic nameplates 6" long x 3" high with white incised lettering ½" high. Attach to equipment with stainless steel or brass screws, rivets or other approved permanent means.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. All installation methods of Section 15050 shall take precedence over the methods of this Section.

### 3.02 INTERPRETATION OF DRAWINGS

- A. Mechanical equipment and such other apparatus as may require maintenance and operation from time to time shall be made easily accessible. Although the equipment may be shown on the Drawings in certain locations, the construction may disclose that such locations do not make its position readily accessible. In such cases, the Owner or his Representative shall be notified before advancing the construction to a stage where a change will reflect additional expense.
- B. Compare actual site conditions with the Drawings and Specifications and include additional work which careful examination would disclose. Before the bidding period, advise the ENGINEER of any omission, error or conflict in the Plans and Specifications.
- C. Equipment, ductwork and piping locations, as shown, are diagrammatic and approximate only unless fixed by dimensions. Actual field conditions govern exact locations. Where possible, adhere to locations on Drawing consistent with building construction and equipment installed by others.

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- D. Contractor shall not scale measurements from the Drawings but check with General Contractor's latest Drawings before proceeding with any work.
- E. Work layouts shall be the responsibility of the Contractor, following minimum requirements as set forth in these Specifications and accompanying Drawings.
- F. Where head room or space conditions appear inadequate, ENGINEER shall be notified before proceeding with installation. If directed by ENGINEER, Contractor shall, without extra charge, make reasonable modifications in layout as needed to prevent conflicts with work of other trades or for proper execution of work.
- G. If, in Contractor's opinion, work is shown or specified in manner or amount as to make it impossible to install a first-class piece of work or fulfilling intent of a perfectly efficient job when complete, refer same to ENGINEER in writing before submitting proposals.
- H. Should Contractor fail to refer such instances to ENGINEER as required above, no excuse for poor, defective or incomplete work will be accepted.

### 3.03 SHOP DRAWINGS

- A. All equipment shall be submitted for approval under these Sections to the ENGINEER.
- B. Do not place orders for any equipment until final approval is received. Allow at least two weeks for submittal review.
- C. If material or equipment is installed before it is approved, Contractor shall be liable for removal and replacement at no extra charge to the Owner.

### 3.04 WARRANTY

- A. Refer to General Conditions. The warranty period for the work under this Section is for one year from date of acceptance. These contractors shall provide free day-and-night service, parts and labor for the complete installation of HVAC and Plumbing systems for this period.

### 3.05 CONTRACTOR'S RESPONSIBILITY

- A. Contractor shall be held responsible for any injuries to people, employees or damage done to building premises or adjoining areas or to other work resulting from execution on his part of work, in any manner whatsoever.
- B. Contractor shall be responsible for proper protection of his work, materials, people or employees from injury or loss done by others and shall make good such injury at his own expense.
- C. The Engineer shall not be responsible for the safety of Contractor's employees.

### 3.06 CUTTING AND PATCHING

- A. All rough cutting and patching required for installation of the mechanical system shall be the responsibility of this contractor. All finish patching relative to this contractor's work shall be the responsibility of other trades in accordance with other sections of this specification. Coordinate all work for a complete and finished installation.

### 3.07 TESTING

- A. Contractor shall submit to the ENGINEER for record and approval a written report for each test conducted. Report shall indicate date of test, system tested, method of testing, name of person or agency witnessing test, and results of tests. If test records are not kept and submitted, it will be assumed that the test was not completed and Contractor will be required to perform the test at ENGINEER 's direction.
- B. All piping, ducts and equipment shall be tested. Contractor shall furnish Labor, materials, instruments and power required for testing unless otherwise indicated under particular section of Specifications.
- C. Tests shall be performed in presence of and to satisfaction of ENGINEER and/or such other parties as may have jurisdiction.
- D. Pressure test shall be applied to piping only before connection of equipment. In no case shall piping, equipment or accessories be subjected to pressures exceeding their ratings.
- E. Defective work shall be promptly repaired or replaced and tests shall be repeated until particular system and/or component parts receive approval of the ENGINEER.
- F. Any damages resulting from tests shall be repaired and damaged materials replaced.
- G. Duration and style of tests shall be as determined by authorities having jurisdiction but in no case less than time prescribed in each Section of Specifications. In general, pressure for tests shall be 1.5 times working pressure unless prescribed otherwise by code, specific specification section or ASTM Guidelines.
- H. Equipment and systems which normally operate during certain seasons of year shall by tested during appropriate season. Test shall be performed on individual equipment, systems and their controls for proper operation, functioning and performance. Latter shall be operated simultaneously with equipment of system being tested.
- I. During testing procedure, remove accessories liable to damage during tests.
- J. Notice shall be furnished to ENGINEER at least two days prior to any testing. Contractor shall be solely responsible for any delays, damages, etc., resulting from failure to notify.
- K. Instruments required under this Contract for permanent installation may be used for testing if re-adjusted and recalibrated for the service for which intended.

### 3.08 CLEANING OF SYSTEM

- A. All piping, ducts and equipment shall be thoroughly cleaned of foreign matter after being placed in operation. System shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in course of removing obstructions shall be repaired or replaced when system is reconnected at no additional cost to the Owner. Bag all duct outlets at start up and cleaning.

### 3.09 ACCESS DOORS

- A. Wherever mechanisms requiring access for operation are concealed in structure and wherever also indicated on the Drawings or where so directed, Contractor shall supply access doors of proper sizes and fire rating necessary to provide ready access to concealed items.

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3.10 PIPE HANGERS, SUPPORTS

- A. Hangers for horizontal lines, except as noted below, shall be spaced no greater than as follows:

1.	Pipe Size	Rod Diameter	Maximum Spacing	
			Copper	Steel
	½"	3/8"	5' - 0"	7' - 0"
	¾"	3/8"	5' - 0"	7' - 0"
	1"	3/8"	6' - 0"	7' - 0"
	1¼"	3/8"	7' - 0"	7' - 0"
	1½"	3/8"	8' - 0"	9' - 0"
	2"	3/8"	8' - 0"	10' - 0"
	2½"	1/2"	9' - 0"	11' - 0"
	3"	1/2"	10' - 0"	12' - 0"
	4" - 5"	5/8"	12' - 0"	14' - 0"
	6" - 8"	3/4"	14' - 0"	17' - 0"

2. Copper tubing shall be supported with split ring hangers, copperized with supporting rod.
3. PVC pipe shall be supported such that the distance between hangers is no more than 4'-0" on center.
4. Use insulation protection saddles or shields for all insulated cold piping and where hanger is outside the insulation. Secure all saddles and shields to the insulation to prevent slippage or shifting that may cause the shield to fall to the ground. Saddles shall be spot welded to hangers.
5. Hangers for horizontal and vertical lines of fire protection piping shall be spaced in accordance with NFPA 13.

- B. Hangers for vertical pipes shall be spaced no greater than as follows:

PIPING MATERIAL	MAX. VERTICAL SPACING
Copper Pipe/Tubing	10'-0"
Galvanized Steel Pipe	15'-0"
PVC Pipe	4'-0"
CPVC Pipe/Tubing	3'-0"

3.11 PIPE LINE IDENTIFICATION

- A. Identification and flow direction is required at each valve and tee at points where pipe passes through walls and at all 30' intervals. Tags shall be as follow:

1.HWS.....	Heating Hot Water Supply
2.HWR.....	Heating Hot Water Return
3.CHWS.....	Chilled Water Supply
4.CHWR.....	Chilled Water Return
5.CD.....	AC Condensate Drain line

3.12 EQUIPMENT IDENTIFICATION

- A. Identify all air handling units, starters and other major equipment items.

3.13 OPERATING INSTRUCTIONS

- A. Operation of system:

1. Contractor is responsible for construction and installation of all mechanical systems and shall supply the services of competent personnel for a period of

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three days. As such, Contractor may be required during the first year to review every phase of all mechanical systems with Owner's personnel and also to instruct and supervise Owner's personnel in the proper operation and maintenance of said system. Time shall be recorded by Contractor and signed by Owner or Representative.

2. Contractor shall also provide three sets of complete operating instructions of all systems installed, bound in a manual. Manual shall contain one approved copy of each shop drawing and submitted data, printed instructions as to care and maintenance of system, and bound in a hard cover and arranged in the following sequence:
  - a. Table of Contents
  - b. Description of Installation
  - c. Care and Maintenance: Including a check and follow-up chart for greasing and oiling of all mechanical equipment and a copy of instructions as to upkeep of motors.
  - d. Manufacturer's Listing: In alphabetical order, of all equipment installed on job, together with a listing of material supplied, manufacturer's address, name and address of local manufacturer's agent.
  - e. Copy of approved submittal

### 3.14 PROJECT CLOSEOUT AND TROUBLE SHOOTING

- A. Each trade shall designate one person to methodically test, adjust, trouble shoot and effect repairs to all equipment, devices and systems. The person shall be available on one hour's notice to answer trouble calls and to fully investigate and repair the cause of the problem. Each trade shall submit the name and phone number of the designated person to the Owner, Engineer and Architect. After final acceptance, this same person shall be available on eight hour's notice for free day-and-night service during the guarantee period.
- B. Contractor shall demonstrate all sequences of control to the Engineer. The temperature control and balancing sub-contractors shall accompany the Engineer during check-out procedure and shall demonstrate proper balancing positions of minimum fresh-air settings. Personnel shall be equipped with tools and spare parts to make minor repairs and adjustments.
- C. Contractor shall demonstrate compliance with balancing of systems in the presence of the Engineer by actual measurement of water and air flows at a minimum of three locations randomly selected by the Engineer. If requested by the Engineer, re-balancing shall be done at no additional charge.

END OF SECTION

SECTION 15180

INSULATION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. General Provisions for Mechanical Work Section 15010 shall apply to all work performed under this Section of the Specifications and shall be considered as included herein.

1.02 SUMMARY

- A. Insulate supply and return hot water piping.
- B. Insulate all chilled water piping.
- C. Insulate supply and return air ducts.
- D. Insulate all outside air ductwork.
- E. Insulate all copper AC condensate piping.

1.03 RELATED SECTIONS

- A. Liquid Heat Transfer - Section 15700
- B. Air Distribution - Section 15800

PART 2 - PRODUCTS

2.01 HEATING HOT WATER PIPING

- A. Fiberglass pipe insulation shall be by Owens Corning type SSL-II or approved equal, with factory applied all-service jacket (ASJ) and two-component adhesive closure system, rated for a maximum service temperature of 850F. For large pipe sizes where SSL-II is not available, the single adhesive SSL closure may be substituted. Circumferential joints shall be sealed by butt strips having a two-component sealing system.
- B. Piping 1-1/2" and smaller shall have a minimum insulation thickness of 1". Piping larger than 1-1/2" shall have a minimum insulation thickness of 2". Insulation thickness is based on a "k" value not exceeding 0.27 Btu per inch/h"ft " F.
- C. Fittings and valves shall be insulated with pre-formed fiberglass fittings. Thickness shall be equal to adjacent pipe insulation. Finish shall be with pre-formed PVC fitting covers.
- D. Flanges, couplings and valve bonnets shall be covered with an oversized pipe insulation sections with low-density blanket insulation being used to fill gaps. Jacketing shall match that used on straight pipe sections. Where fittings are to be left exposed, insulation ends should be beveled away from bolts for easy access.

2.02 CHILLED WATER AND DUAL TEMPERATURE PIPING

- A. Molded fibrous glass pipe insulation shall comply with the requirements of ASTM C 547 and meet ASTM C 585 for sizes required in the particular system. It shall be of a self-drying type suitable for installation on piping systems. Product shall include a factory applied integral vapor retarder extending under the evaporator area of the wick and covering not less than 98% of the circumference of the product. Exposed evaporator

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area shall be not less than 0.1 sq. ft./linear ft. of product. Vapor retarder shall be fungi resistant when tested per ASTM C 1338. Acceptable Manufacturers are Owens Corning VaporWick® Pipe Insulation or pre-approved equal.

Piping 1-1/2" and smaller shall have a minimum insulation thickness of 1".  
Piping larger than 1-1/2" shall have a minimum insulation thickness of 1-1/2".  
Insulation thickness is based on a "k" value not exceeding 0.27 Btu per inch/h"ft"

- B. Fittings and valves shall be insulated per manufacturer's instructions:
  - 1. Fittings and valves shall be wrapped continuously with wicking material prior to installing insulation to ensure a continuous path for removal of condensation.
  - 2. Standard site fabricated connections (e.g. mitered, segmented, or fish mouth) are recommended for bends and fittings.
  - 3. Standard PVC fittings with blanket insulation or molded/preformed fiberglass fittings may be used.
  - 4. Standard oversizing practices shall be used for valves and flanges.

### 2.03 DUCT INSULATION

- A. Supply, return, and outside air intake ductwork shall be insulated with 2" thick, 1.5 # density fiberglass duct insulation as manufactured by Owens Corning or approved equal. Insulation shall have a foil-faced vapor barrier.
- B. All supply, return and exhaust ductwork in the mechanical room shall be lined internally sound lined with 1-½ " Acoustical Duct Liner by Johns Manville Model Linqoustic HP.

### 2.04 AC CONDENSATE PIPING

- A. Copper AC condensate: ¾" Armaflex.
- B. PVC AC condensate: No insulation.

## PART 3 - EXECUTION

### 3.01 PIPE AND FITTINGS

- A. Apply insulation to clean, dry surfaces at temperatures between 35°F and 110°F after system has been tested and leaks eliminated.
- B. Provide saddles as specified in Section 15010. Pipe hangers shall be outside the insulation saddles.
- C. Insulation covering shall be cleaned before the self-sealing lap is put in place and rubbed. Longitudinal seams shall be additionally fastened with outward clinched staples and painted over with Johns Manville No. CP-11 vapor barrier mastic.
- D. At elbows and fittings, all raw ends shall be thoroughly coated with JM No. CP-11. Segmented insulation shall then be applied and then covered with Zeston PVC. PVC shall be taped at seams and at connection point to the all service jacket.
- E. Prevent damage to vapor barriers during installation of the insulation and seal insulation airtight.
- F. Use no insulation, adhesives, sealers, mastics or other insulating materials that have a flame spread rating greater than 25 or that have a smoke developed rating higher than 50.

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- G. Apply insulation with tightly butted joints. Fill cracks, voids and depressions with adhering cement.
- H. Apply lagging adhesive directly from original container without cutting and according to manufacturer's instructions. Use of wheat paste is not permitted.
- I. Insulation will run continuously through walls inside sleeves.
- J. Hangers for vertical piping will be affixed to the pipe over insulating tape. The insulating tape shall be wrapped completely around the support bracket for its entire length to a thickness of ½" minimum.
- K. Any unusual situation will be approved by the Engineer before closing up.
- L. All valves will be tagged with brass tags using plastic wire ties around the insulation of the adjacent pipe.
- M. All cold service, valves, etc. shall be covered with molded, removable covers securely taped in place to prevent admission of air. Each "case" shall be labeled with magic marker with name of device within.
- N. Wrap cold service valve stems and exposed cold surfaces with Armaflex tape.

### 3.02 DUCTWORK

- A. Internal duct lining shall be installed in strict accordance with the manufacturer's instructions. Ductwork must be cleaned and properly prepared. All duct lining shall be secured with mechanical fasteners in addition to adhesives.
- B. Outside air intake ducts: Wrap tightly, butt circumferential joints and overlap longitudinal joints a minimum of two inches.
  - 1. Adhere to duct with four-inch strips of insulation bonding adhesive 8" oc.
  - 2. Ductwork over 24" wide: secure with mechanical fasteners not more than 18" oc.
  - 3. Circumferential joints: Secure the two-inch flange of the facing with 9/16" flare door staples 6" oc and tape with minimum of three-inch-wide, foil reinforced Kraft tape.
  - 4. Tape pin penetrations and punctures.
  - 5. In exposed applications, cover joints with three-inch-wide, foil reinforced Kraft tape.

END OF SECTION

SECTION 15700

LIQUID HEAT TRANSFER

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. General Provisions for Mechanical Work Section 15010 shall apply to all work performed under this Section of the Specifications and shall be considered a part of this Section.

1.02 SUMMARY

- A. Provide and install strainers, piping, valves, fittings, and associated equipment.
- B. Install temperature control valves and separable wells provided under Section 15900.
- C. Provide and install balancing valves, thermometers, pressure gauges, air vents and specialties.
- D. Provide and install air handling units.
- E. Provide and install inline pump.

1.03 RELATED SECTIONS

- A. General Provisions for Mechanical Work – Section 15010
- B. Insulation - Section 15180
- C. Air Distribution – Section 15800
- D. Controls and Instrumentation - Section 15900
- E. Testing, Adjusting and Balancing - Section 15990
- F. Electrical - Division 16

PART 2 - PRODUCTS

2.01 WATER PIPE AND FITTINGS

- A. Piping 3" and larger shall be schedule 40 black steel with welded fittings and 150 lb. flanges.
- B. Piping 2-1/2" and smaller shall be schedule 40 black steel with screwed fitting or Type L hard copper seamless tube as manufactured by Anaconda, Revere, or Chase, with wrought copper fittings, soldered with lead-free solder. Unions or flanges shall be installed at all connections to all equipment.
- C. Hangers and supports are specified in Section 15010.
- D. All cast steel flanges shall be dimensioned and drilled to conform with A.S.A. Standards. Flanges for fittings and valves shall be cast integral and all fillets shall be of large radius. The flanged face shall be in every case perpendicular to the axis of the pipe, valve or fittings. Sweat fittings shall be wrought copper.
- E. Welded ells, tees, reducers, and caps shall be wrought or forged construction (not fabricated) with uniform, truly circular inside bore not less than the inside diameter of pipe

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to which connected, a wall thickness not less than that of the pipe to which connected, and true, round machined ends in a plane perpendicular to the axis of pipe to which connected. Elbows to have face to center dimension equal to not less than 1-1/2" nominal diameters of the pipe to which connected and shall be curved on an axial radius equal to not less than nominal pipe diameter. Reducers shall be eccentric type installed for proper venting.

- F. All connections on screwed piping to be flanged, shall be made with cast flanges. All flanges shall be dimensioned and drilled to conform with the A.S.A. Standard. Welding, fitting and nipples shall be the same weight and material as the pipe with which it is used.
- G. All brass fittings shall be cast brass on cast iron pattern and shall have the symbol or initial of the manufacturer cast on each fitting.
- H. All gaskets shall be 1/16" thick, ring type compressed asbestos sheet.
- I. Bolts shall be made of commercial bolt steel with square forged heads and with cold pressed semi-finished hexagon nuts. All threads shall be U.S. Standard.
- J. Except as shown otherwise, hangers for piping 2" and smaller shall be of the split ring type with fastening device. Hangers for piping 2" and 5" shall be of the adjustable clevis hanger type. Hanger rods shall be machine threads.
- K. All connections between dissimilar pipe material shall have dielectric fittings or unions.

### 2.02 VALVES AND SPECIALTIES

- A. Provide where shown on the Drawings and at all high points in the piping and at all unit heaters and coils, a #7 B & G or Taco float type automatic air vent with copper float and stainless steel head, and seat and shut-off. Furnish to the General Contractor access panels as manufactured by Milcor for each concealed air vent.
- B. Provide all required valves for the equipment as shown on the Plans and as required for proper operation of the equipment. Provide throttling valves where regulation of flow is necessary or desirable. Check valves where reverse flow is liable under any conditions and shut-off valves on all lines connecting to any piece of equipment, including heating and ventilating units, coils, unit heaters and fin tube radiation. All valves shall be 125-lb. standard construction. Valves shall be bronze or brass. Valves 3" and larger shall be flanged ends. All valves shall have the name or trademark of the manufacturer and guaranteed working pressure cast on the body of the valve. All equipment shall have isolation valves. All valves shall have extensions sufficient to clear installation.
- C. Provide all valves of the same manufacturer (Jenkins, Fairbanks, Crane or Lunkenheimer) of top line, first quality.
- D. Check valves shall be of the horizontal swing type with hinged check, ground seat and approved type discs.
- E. Globe and angling valves used for throttling services shall be of the plug type with renewable seats and discs. Seats and discs for plug type valves shall be of approved type metal alloy.
- F. Provide balancing valves, as indicated on the Drawings, equal to Sarco "Balance Master" combination shut-off and balance valve. Furnish access panels for all concealed balancing valves and flow meters except where readily accessible through removable ceiling tiles. Balancing valves over 2" shall be flanged; 2" and under shall be screwed. All balancing valves shall have memory stops. Provide Owner with sample prior to installation.

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### 2.03 AIR HANDLING UNIT (G-AHU-1,2 and 3)

- A. Provide and install one Trane Performance Climate Changer or equal by Haakon or Carrier.
- B. Unit shall be size and capacity as shown on the drawings and schedules.
- C. Unit layout and configuration shall be as defined in schedule and detail.
- D. Unit manufacturer shall ship separate segments so unit can be broken down for ease of installation in tight spaces. Construct casing sections capable of operating from -4"wg to +6"wg.
- E. Manufacturer to provide an integral base frame for either ceiling suspension of units or to support and raise all sections of the unit for proper trapping. Contractor will be responsible for providing a housekeeping pad when unit base frame is not of sufficient height to properly trap unit. Unit base frames not constructed of galvanized steel shall be chemically cleaned and coated with both a rust-inhibiting primer and finished coat of rust-inhibiting enamel. Unit base height to be included in trap.
- F. Unit Casing
  - 1. Unit manufacturer shall ship unit in segments as specified by the contractor for ease of installation in tight spaces. The entire air handler shall be constructed of galvanized steel. Casing finished to meet ASTM B117 250-hour salt-spray test. The removal of access panels or access doors shall not affect the structural integrity of the unit. All removable panels shall be gasketed. All doors shall have gasketing around full perimeter to prevent air leakage. Contractor shall be responsible to provide connection flanges and all other framework that is needed to properly support the unit.
  - 2. Casing performance - Casing air leakage shall not exceed leak class 6 (CL = 6) per ASHRAE 111 at specified casing pressure, where maximum casing leakage (CFM/100 ft<sup>2</sup> of casing surface area) = CL X P<sup>0.65</sup>.
  - 3. Air leakage shall be determined at 1.00 times maximum casing static pressure up to 8 inches w.g. Specified air leakage shall be accomplished without the use of caulk. Total estimated air leakage shall be reported for each unit in CFM, as a percentage of supply air, and as an ASHRAE 111 Leakage Class.
  - 4. Under 55F supply air temperature and design conditions on the exterior of the unit of 81F dry bulb and 73F wet bulb, condensation shall not form on the casing exterior. The AHU manufacturer shall provide tested casing thermal performance for the scheduled supply air temperature plotted on a psychrometric chart. The design condition on the exterior of the unit shall also be plotted on the chart. If tested casing thermal data is not available, AHU manufacturer shall provide, in writing to the Engineer and Owner, a guarantee against condensation forming on the unit exterior at the stated design conditions above. The guarantee shall note that the AHU manufacturer will cover all expenses associated with modifying units in the field should external condensate form on them. In lieu of AHU manufacturer providing a written guarantee, the installing contractor must provide additional external insulation on AHU to prevent condensation.
  - 5. Unit casing (wall/floor/roof panels and doors) shall be able to withstand up to 1.5 times design static pressure, or 8-inch w.g., whichever is less, and shall not exceed 0.0042 per inch of panel span (L/240).
  - 6. Floor panels shall be double-wall construction and designed to support a 250-lb load during maintenance activities and shall deflect no more than 0.0042 per inch of panel span.
  - 7. Unit casing panels shall be 2-inch double-wall construction, with solid galvanized exterior and solid galvanized interior, to facilitate cleaning of unit interior.

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8. Unit casing panels (roof, walls, floor) and doors shall be provided with a minimum thermal resistance (R-value) of 13 Hr\*Ft<sup>2</sup>\*°F/BTU.
9. Unit casing panels (roof, walls, floor) and external structural frame members shall be completely insulated filling the entire panel cavity in all directions so that no voids exist. Panel insulation shall comply with NFPA 90A.
10. Casing panel inner liners must not extend to the exterior of the unit or contact the exterior frame. A mid-span, no-through-metal, internal thermal break shall be provided for all unit casing panels.
11. Access panels and/or access doors shall be provided in all sections to allow easy access to drain pan, coil(s), motor, drive components and bearings for cleaning, inspection, and maintenance.
12. Access panels and doors shall be fully removable without the use of specialized tools to allow complete access of interior surfaces.

### G Access Doors

1. Access doors shall be 2-inch double-wall construction. Interior and exterior shall be of the same construction as the interior and exterior wall panels.
2. All doors downstream of the cooling coil shall be provided with a thermal break construction of door panel and door frame.
3. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage.
4. Door hardware shall be surface-mounted to prevent through-cabinet penetrations that could likely weaken the casing leakage and thermal performance.
5. Handle hardware shall be designed to prevent unintended closure.
6. Access doors shall be hinged and removable without the use of specialized tools to allow.
7. Hinges shall be interchangeable with the door handle hardware to allow for alternating door swing in the field to minimize access interference due to unforeseen job site obstructions.
8. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section.
9. All doors shall be a 60-inch high when sufficient unit height is available, or the maximum height allowed by the unit height.
10. Multiple door handles shall be provided for each latching point of the door necessary to maintain the specified air leakage integrity of the unit.

### H. Primary Drain Pans

1. All cooling coil sections shall be provided with an insulated, double-wall, galvanized drain pan.
2. The drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes, pitched toward drain connections, promoting positive drainage to eliminate stagnant water conditions when unit is installed level and trapped per manufacturer's requirements. See section 2.07, paragraph F through H for specifications on intermediate drain pans between cooling coils.
3. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.
4. All drain pan threaded connections shall be visible external to the unit. Threaded connections under the unit floor shall not be accepted.
5. Drain connections shall be of the same material as the primary drain pan and shall extend a minimum 2-1/2-inch beyond the base to ensure adequate room for field piping of condensate traps.
6. The installing contractor is responsible to ensure the unit is installed level, trapped in accordance with the manufacturer's requirements, and visually inspected to ensure proper drainage of condensate.
7. Coil support members inside the drain pan shall be of the same material as the

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drain pan and coil casing.

7. If drain pans are required for heating coils, access sections, or mixing sections they will be indicated in the plans.

### I. Fans

1. Fan sections shall have a minimum of one hinged and latched access door located on the drive side of the unit to allow inspection and maintenance of the fan, motor, and drive components.
2. Provide fans of type and class as specified on the schedule. Fan shafts shall be solid steel, coated with a rust-inhibiting coating, and properly designed so that fan shaft does not pass through first critical speed as unit comes up to rated RPM. All fans shall be statically and dynamically tested by the manufacturer for vibration and alignment as an assembly at the operating RPM to meet design specifications. Fans controlled by variable frequency drives shall be statically and dynamically tested for vibration and alignment at speeds between 25% and 100% of design RPM. If fans are not factory-tested for vibration and alignment, the contractor shall be responsible for cost and labor associated with field balancing and certified vibration performance. Fan wheels shall be keyed to fan shafts to prevent slipping.
3. Belt-driven fans shall be provided with grease lubricated, self-aligning, anti-friction bearings selected for L-50 200,000-hour average life per ANSI/AFBMA Standard 9. Lubrication lines for both bearings shall be extended to the drive side of the AHU and rigidly attached to support bracket with zerk fittings. Lubrication lines shall be a clear, high-pressure, polymer to aid in visual inspection. If extended lubrication lines are not provided, manufacturer shall provide permanently lubricated bearing with engineering calculations for proof of bearing life.
4. All fans, including direct drive plenum fans, shall be mounted on isolation bases. Internally-mounted motor shall be on the same isolation base. Fan and motor shall be internally isolated with spring isolators. Unit sizes up to a nominal 4,000 CFM shall have 1-inch spring isolation. Units with nominal CFM's higher than 4,000 shall have 2-inch springs. A flexible connection (e.g. canvas duct) shall be installed between fan and unit casing to ensure complete isolation. Flexible connection shall comply with NFPA 90A and UL 181 requirements. If fans and motors are not internally isolated, then the entire unit shall be externally isolated from the building, including supply and return duct work, piping, and electrical connections. External isolation shall be furnished by the installing contractor in order to avoid transmission of noise and vibration through the ductwork and building structure.

### J. Motors and Drives

1. All motors and drives shall be factory-installed and run tested. All motors shall be installed on a slide base to permit adjustment of belt tension. Slide base shall be designed to accept all motor sizes offered by the air-handler manufacturer for that fan size to allow a motor change in the future, should airflow requirements change. Fan sections without factory-installed motors shall have motors field installed by the contractor. The contractor shall be responsible for all costs associated with installation of motor and drive, alignment of sheaves and belts, run testing of the motor, and balancing of the assembly.
2. Motors shall meet or exceed all NEMA Standards Publication MG 1 - 2006 requirements and comply with NEMA Premium efficiency levels when applicable. Motors shall comply with applicable requirements of NEC and shall be UL Listed.
3. Fan Motors shall be heavy duty, open drip-proof operable at 460 volts, 60Hz, 3-phase. If applicable, motor efficiency shall meet or exceed NEMA Premium efficiencies.
4. Belt driven fans shall use 4-pole, 1800 rpm, motors, NEMA B design, with Class B insulation, capable to operate continuously at 104 deg F (40 deg C) without tripping overloads.

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5. Direct driven fans shall use 2-pole (3600 rpm), 4-pole (1800 rpm) or 6-pole (1200 rpm) motors, NEMA Design B, with Class B insulation capable to operate continuously at 104 deg F (40 deg C) without tripping overloads.
6. Motors shall have a +/- 10 percent voltage utilization range to protect against voltage variation.
7. V-Belt Drive shall be fixed pitch rated at 1.5 times the motor nameplate. Drives 20 hp and larger or any drives on units equipped with VFDs shall be fixed pitch.
8. Manufacturer shall provide for each fan a nameplate with the following information to assist air balance contractor in start up and service personnel in maintenance:
  - a. Fan and motor sheave part number
  - b. Fan and motor bushing part number
  - c. Number of belts and belt part numbers
  - d. Fan design RPM and motor HPe.
  - e. Belt tension and deflection
  - f. Center distance between shafts

### K. COILS

1. Coils section header end panel shall be removable to allow for removal and replacement of coils without impacting the structural integrity of the unit.
2. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil.
3. Coils shall be manufactured with plate fins to minimize water carryover and maximize airside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint.
4. Construct coil casings of galvanized steel. End supports and tube sheets shall have belled tube holes to minimize wear of the tube wall during thermal expansion and contraction of the tube.
5. All coils shall be completely cleaned prior to installation into the air handling unit. Complete fin bundle in direction of airflow shall be degreased and steam cleaned to remove any lubricants used in the manufacturing of the fins, or dirt that may have accumulated, in order to minimize the chance for water carryover.
6. When two or more cooling coils are stacked in the unit, an intermediate drain pan shall be installed between each coil. The intermediate drain pan shall be designed being of sufficient size to collect all condensation produced from the coil and sloped to promote positive drainage to eliminate stagnant water conditions. The intermediate drain pan shall be constructed of the same material as the sections primary drain pan.
7. The intermediate drain pan shall begin at the leading face of the water-producing device and be of sufficient length extending downstream to prevent condensate from passing through the air stream of the lower coil.
8. Intermediate drain pan shall include downspouts to direct condensate to the primary drain pan. The intermediate drain pan outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

### L. FILTERS

1. Provide factory-fabricated filter section of the same construction and finish as unit casings. Filter section shall have side access filter guides and access door(s) extending the full height of the casing to facilitate filter removal. Construct doors in accordance with Section 2.04. Provide fixed filter blockoffs as required to prevent air bypass around filters. Blockoffs shall not need to be removed during filter replacement. Filters to be of size, and quantity needed to maximize filter face area of each particular unit size.
2. Filter type, MERV rating, and arrangement shall be provided as defined in project plans and schedule

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3. Manufacturer shall provide one set of startup filters.

### M. DAMPERS

1. All dampers, with the exception of external bypass and multizones (if scheduled), shall be internally mounted. Dampers shall be premium ultra low leak and located as indicated on the schedule and plans. Blade arrangement (parallel or opposed) shall be provided as indicated on the schedule and drawings. Dampers shall be Ruskin CD60 double-skin airfoil design or equivalent for minimal air leakage and pressure drop. Leakage rate shall not exceed 4 CFM/square foot at one inch water gauge complying with ASHRAE 90.1 maximum damper leakage and shall be AMCA licensed for Class 1A. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Manufacturer shall submit brand and model of damper(s) being furnished, if not Ruskin CD60.

### N. SUBMITTALS

1. Submit unit performance including: capacity, nominal and operating performance.
2. Submit shop drawings indicating overall dimensions as well as installation, operation and service clearances. Indicate lift points and recommendations. Indicate unit shipping split locations, and split dimensions, installation and operating weights including dimensions.
3. Provide fan curves with specified operating point clearly plotted.
4. Submit data on electrical requirements. Include safety and start-up instructions.
5. Submit sound data certified to ARI 260.

### O. START-UP AND OPERATING REQUIREMENTS

1. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters in place, bearings lubricated (if applicable), condensate properly trapped, piping connections verified and leak-tested, belts aligned and tensioned, all shipping braces removed, bearing set screws torqued, and fan has been test run under observation.

### P. WARRANTY

1. The equipment manufacturer shall provide, at no additional cost, a standard parts warranty that covers a period of one year from unit start-up or 18 months from shipment, whichever occurs first. This warrants that all products are free from defects in material and workmanship and shall meet the capacities and ratings set forth in the equipment manufacturer's catalog and bulletins.

### Q. QUALITY ASSURANCE

1. Air Handling Units: Certify air volume, static pressure, fan speed, brake horsepower and selection procedures in accordance with ARI 430. If air handling units are not certified in accordance with ARI 430, contractor shall be responsible for expenses associated with testing of units after installation to verify performance of fan. Any costs incurred to adjust fans to meet scheduled capacities shall be the sole responsibility of the contractor.
2. Air Coils: Certify capacities, pressure drops and selection procedures in accordance with ARI 410-87.

## 2.04 INLINE PUMP

- A. Provide inline pump where shown and as scheduled on the drawings.
- B. In Line pumps shall have bronze fitted construction, including cast iron casings, bronze or

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copper shaft sleeves, alloy steel shafts and bronze impellers.

- C. Bearings shall be either be sleeve type or regreasable ball bearings.
- D. Provide casing wear rings, drain and vent connections and flexible coupling or direct drive connection between pump and motor.
- E. If the scheduled pump includes ball bearings and a direct drive motor to impeller connection, the submitted pump shall not have sleeve bearings or a flexible coupling between pump and motor.
- F. Provide inline pumps as manufactured by Taco, Grundfoss or Armstrong.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION – HEATING / CHILLED WATER

- A. Locate supply and return mains as shown on the Drawings and as directed by the Architect in the field. Where possible, conceal in ceilings and wall spaces, supported and pitched to provide proper drainage, venting and avoid noise in operation. Piping shall be straight, true and round, and without obstruction. Pipe for welding shall be machine cut and properly beveled for welding.
- B. Make no direct welded connections to valves, strainers and related equipment. Fishmouthing and weldolets will not be acceptable with the exception that weldolets may be used on mains outside of the Boiler Room for runouts 1" and smaller. Threads shall be standard, clean cut and tapered. All pipe shall be reamed free from burrs and kept free of scale and dirt. Threaded joints shall be made up with lubrication oil applied to the male thread only and shall have not more than two threads exposed when made tight. Threads shall comply with "American Standard Threads."
- C. Provide cocks of ½" globe valve with ¾" hose end, installed at all low points. System shall be installed, pitched and valved so that all parts of the system may be drained, in part or in its entirety, without dismantling the system.
- D. Install and arrange hangers, anchors and guides to maintain the required grading and pitching of piping to prevent vibration and to provide for expansion and contraction without straining or distorting pipes.
- G. Hangers, inserts and supports are specified under Section 15010. Expansion shields may be used only with the approval of the Architect.
- H. Support vertical lines at their bases using either a suitable hanger placed in the horizontal line near the riser or a base fitting set on a pedestal or foundation.
- I. Close ends of pipes with caps or plugs, to prevent the internal accumulation of dirt or foreign material.
- J. Where shown on the Drawings, provide vent points at high points of system, at the ends of circuits and all points where a drop in elevation of main is required.
- K. Provide hangers and steel supports for equipment to be suspended such as exhaust fans.

#### 3.02 CLEANING

- A. Clean strainers after one week's running time and replace with fine mesh.

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### 3.03 CONTROL VALVES

- A. Install in accordance with manufacturer's recommendations.
- B. All control valves shall have replaceable actuators.

### 3.04 STRAINERS

- A. Provide before each control valve on runout pipes 1¼" diameter and larger.

### 3.05 THERMOMETERS

- A. Adjust for ease of view.

### 3.06 AIR HANDLING UNITS

- A. Install one set of filters when units are ready for system testing, adjusting and balancing.
- B. Remove first set and install second set after date of final acceptance.
- C. Install units according to manufacturer's recommendations.

### 3.07 Pumps

- A. Set pumps level.
- B. Install per manufacturer's recommendations.

### 3.08 DRAINAGE

- A. Set all equipment so that pipe pitches to outlets and so that hydronic coils may be drained. Run all pipe concealed and pitch at 1/8" per foot (min.).

END OF SECTION

SECTION 15800

AIR DISTRIBUTION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. General Provisions for Mechanical Work Section 15010 shall apply to all work performed under this section of the specifications and shall be considered a part of this section.

1.02 SCOPE

- A. Provide all ductwork and duct connections.
- B. Provide fans – all types.
- C. Provide duct mounted hot water heating coils.
- D. Provide all turning vanes, splitter dampers, fire dampers, volume control dampers and balancing devices in ducts.

1.03 WORK IN OTHER SECTIONS AFFECTING WORK TO BE DONE IN THIS SECTION

- A. General Provisions for Mechanical Work – Section 15010
- B. Insulation - Section 15180
- C. Liquid Heat Transfer - Section 15700
- D. Controls and Instrumentation - Section 15900
- E. Testing, Adjusting and Balancing - Section 15990
- F. Electrical - Division 16

1.04 CODES AND STANDARDS

- A. NFC-90A and 90B shall govern all work.
- B. ASHRAE & SMACNA Standards shall be used for duct construction, support bracing tap-in reinforcing and fibrous duct components standards.

PART 2 - PRODUCTS

2.01 DUCTWORK & ACCESSORIES

- A. All ductwork shall be constructed of prime, first quality materials. All reinforcing, longitudinal & cross joints, elbows, transitions, hangers, access panels, volume dampers, etc., shall be as shown and specified in SMACNA's HVAC Duct Construction Manual 1985, first edition.
- B. Ductwork dimensions indicated on drawings are net inside dimensions required for airflow. Increase ductwork to allow for internal insulation thickness.
- C. Ductwork Gauges (Unless otherwise noted on the drawings)

Size	Gauge
0-12	26 GA.
13-30	24 GA.

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31-54 22 GA.

55- 20 GA.

2.02 FLEXIBLE CONNECTIONS

- A. Use Neoprene heavy duty type 6" clear duct to duct.

2.03 FANS

A. INLINE MIXED FLOW (QUIET) AXIAL EXHAUST FANS (G-RAF-1)

1. Return air fans shall be inline of the mixed flow type, size and location as shown on drawings and schedules.
2. The housing shall be constructed of continuously welded heavy gauge steel to assure no air leakage. Housing shall have inlet and outlet collars for slip fit duct connections. The housing and bearing support shall be constructed of structural steel members to prevent vibration and rigidly support the shaft and bearings. Welded steel vanes shall straighten the flow of air from the fan discharge and support bearings and drives.
3. Units shall incorporate a universal mounting system that allows the fan to be mounted in either vertical or horizontal configurations and field rotation of the motor position in 90 degree increments. Bearing life shall not be reduced below specified level in different configurations.
4. The wheel shall be of the mixed flow type. Wheels shall have a wheel cone, spherical back plate and single thickness cambered blades. Wheels shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19. The wheel cone and fan inlet cone shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.
5. Turned, precision ground and polished steel shafts shall be sized so the first critical speed is at least 25% over the maximum operating speed for each pressure class. Close tolerances shall be maintained where the shaft makes contact with the bearing.
6. Bearings shall be heavy duty, grease lubricated, self-aligning ball or roller flange mounted bearings with extended lubrication lines. Bearings shall be selected for a minimum life (L-10) of 80,000 hours at maximum operating speed and horsepower for each construction level.
7. Each assembled fan shall be test run at the factory at the specified fan RPM and vibration signatures shall be taken on each bearing in three planes; horizontal, vertical, and axial. The maximum allowable fan vibration shall be 0.150 in./sec peak velocity, filter-in reading as measured at the fan RPM. This report shall be provided at no charge to the customer upon request.
8. Inlet and outlet sound power levels shall be provided for each of the eight octave bands at the point of operation.
9. Fans shall be licensed to bear the AMCA Seal for sound and air performance.
10. Mixed flow fans shall be manufactured by Greenheck, or equal by Cook or Barry Blower

B. CENTRIFUGAL (BLOWER TYPE) FANS (G-RAF-2A & 2B)

1. Return air fans shall be of the belt drive utility fan type in AMCA Arrangement 10 with a single width, single inlet housing in CW or CCW rotation as specified.

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2. The housing shall be constructed of heavy gauge galvanized steel with lock formed seams permitting no air leakage. The housing shall be field rotatable to any of the eight standard discharge positions. Housing and bearing supports shall be constructed of welded steel members to prevent vibration and rigidly support the shaft and bearings.
3. The fan wheel shall be of the forward curved type and shall be constructed of heavy gauge steel with uniform stamped blades. Wheels shall be statically and dynamically balanced. The wheel cone and fan inlet cone shall be carefully matched for maximum performance and operating efficiency. Motors shall be permanently lubricated, heavy duty ball bearing type carefully matched to the fan load and furnished at the specified voltage, phase and enclosure.
4. The fan shaft shall be ground and polished solid steel mounted in heavy duty, permanently sealed, pillow block ball bearings. Bearings shall be selected for a minimum L50 life in excess of 200,000 hours at maximum cataloged operating speed. Drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the fully machined cast iron type, keyed, and securely attached to the wheel and motor shafts. The motor pulley shall be adjustable for final system balancing.
5. Fan performance shall be based on tests conducted in accordance with AMCA Standard 210 for air moving devices, and fans shall be licensed to bear the AMCA Certified Ratings Seal for air performance.
6. Utility fans shall be Model SFB (with forward curved wheels) as manufactured by Greenheck or equal by Cook or Barry Blower.

### 2.03 DUCT MOUNTED HOT WATER HEATING COIL

- A. Provide hot water coils suitable for duct installation with capacities, pressure drops and leaving air temperatures as shown on Drawings.
- B. Coil shall be ½" or 5/8" copper tube expanded mechanically into continuous aluminum fin collars, with copper or bronze headers and galvanized steel casings.
- C. Proof test at 300 psi and leak test at 250 psi air pressure under water. Certify suitability for 200 psi working pressure.
- D. Coil shall meet requirements of ARI 410 74.
- E. Coils shall be manufactured by American Air Coil, Carrier or Trane.

## PART 3 - EXECUTION

### 3.01 DUCTWORK

- A. Dissimilar metal joints shall be insulated with fiber gaskets and bolts with ferrules and washers so there will be no contact between metals.
- B. All rectangular ducts to be insulated shall be paneled for stiffening. All other ductwork shall be crossbroken to prevent vibration.
- C. Duct supports shall be spaced not more than 8'0" oc. and shall be steel strap hangers, (perforated strap not permitted) for ducts up to 30" wide; angle hangers for ducts over 20" wide. Strap hangers shall be 1" x 16 gauge minimum extending on both sides of duct and turning under 2", fastened to sides and bottom with sheet metal screws.

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- D. Dampers splitters and turning vanes shall be installed as shown or as required. All dampers shall be at least one gauge heavier than duct in which installed, reinforced as necessary and equipped with quadrant and locking device.
- E. Access doors in ducts shall be located where required material shall correspond to ductwork in which installed.
- F. Square throat round heel elbows are not allowed. Fabricate elbows square with type turning vanes. Provide acoustical air turning vanes by Johns Manville on all new elbows in the mechanical room.
- G. All ducts shall be made air tight with compound, silicone or other suitable means for .02% maximum leakage.

### 3.02 FANS

- A. Provide and install all components as here specified.
- B. Set fans level.
- B. Install per manufacturer's recommendations.

### 3.03 DUCT MOUNTED HEATING COILS

- A. Install where shown on the drawings and in according to manufacturer's recommendations.

### 3.04 FLEXIBLE CONNECTIONS

- A. Attach at inlet and outlet of fans so that metal is separated by 6" minimum and so that joint is air tight. Provide flexible connection at all such motorized equipment and at building expansion joints.

### 3.05 FIELD QUALITY CONTROL

- A. Leakage Tests: After each duct system which is constructed for duct classes over 3" is completed, test for duct leakage in accordance with SMACNA HVAC Air Duct Leakage Test Manual. Repair leaks and repeat tests until total leakage is less than 1% of system design air flow.

### 3.06 ADJUSTING AND CLEANING

- A. Cleaning ductwork internally, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interface with painting or cause paint deterioration.
- B. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.
- C. Balancing: Refer to Division 15 section "Testing, Adjusting and Balancing" for air distribution balancing of metal ductwork, not work of this section. Seal any leaks in ductwork that become apparent in balancing process.

END OF SECTION

SECTION 15900

CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. General Provisions for Mechanical General Requirements Section 15010 shall apply to all work performed under this section of the specifications and shall be considered a part of this section.

1.02 GENERAL

- A. Provide new DDC controls for the new central station air handling unit (G-AHU-1 and 2) and associated return fans. New equipment shall integrate to the existing building Siemens Apogee system already in place. Provide all necessary devices, panels, conduit, wiring, programming, graphics and debugging for a complete installation of these pieces of equipment. This contractor shall remove and dispose existing controls from the equipment removed that will not be used for the new AHU's.
- B. All control equipment shall be fully proportioning unless specifically called out to be two position, and the latest state-of-the-art in manufacture and design. Unless otherwise specified, the following control and actuation shall be employed for the different systems:

<u>System</u>	<u>Control</u>	<u>Actuation</u>
Air Handling Units	DDC	Electronic
Return Air Fans	DDC	Electronic

- C. The control systems shall be installed by competent control mechanics and electricians regularly trained by the manufacturer of the control equipment. All control equipment shall be the product of one (1) manufacturer and all ATC components shall be capable of interfacing with the HVAC equipment. The factory trained control contractor must maintain adequate staff and offer standard services to fully support the owner in the timely maintenance, repair, and operation of the control system. Contractors who do not maintain such staff and offer services or must develop some for this project are not acceptable. Bids from franchised dealers or others whose principal business is not the installation and service of temperature control systems will not be acceptable.
- D. All products of the FMC shall be provided with the following agency approvals. With the submittal documents, verification that the approvals exist for all submitted products, shall be provided. Systems or products not currently offering the following approvals are not acceptable.

UL-916; Energy Management System  
UL-873; Temperature Indication and Regulating Equipment  
UL-864; Subcategories UUKL, QVAX, UDTZ; Fire and Smoke Control Systems  
FCC; Part 15, Subpart J, Class A Computing Devices

All products shall be labeled with the appropriate approval markings. System installation shall comply with NFPA, NEMA, Local and National Codes.

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### 1.03 SCOPE

- A. The control system provided shall consist of all microprocessors, transformers, transducers, relays, thermostats, dampers, damper operators, air terminal operators, valves, valve operators and all other necessary control components, along with a complete system of, interlocking and communication wiring /cabling to fill the intent of the specification and provide for a complete and operable system. Provide damper operators for equipment such as mixing dampers, where such operators are not supplied by the equipment manufacturers.
- B. Equipment has been specified stripped of factory controls. All new controls to be Siemens.
- C. Alarms, where applicable, and all interlocking wiring required shall be provided by the ATC Subcontractor. Alarms will be centrally dialed out to pagers, email and the workstation utilizing Remote Notification software.
- D. All interlocking wiring and installation of control devices associated with the air handling units, VAV boxes, etc., shall be provided by the ATC Subcontractor. Close coordination shall be exercised between the ATC Subcontractor and the HVAC Subcontractor and equipment manufacturers so that installation will be provided in a manner to result in fully operable systems, as intended in these specifications.
- E. Provide incidental 110V power wiring to panels and control transformers where not shown on electrical drawings.
- F. Provide graphics of all systems and points on existing work station located at Licht Courthouse in Downtown Providence, RI.

### 1.04 INCIDENTAL WORK BY OTHERS

- A. The following incidental work shall be furnished by the designated Subcontractor under the supervision of the ATC Subcontractor:
  - 1. The HVAC subcontractor shall coordinate required work with ATC and, without limiting the generality thereof, the work he is to perform for the ATC shall include the following:
    - a. Install automatic valves, sensor wells and other similar equipment that are specified to be supplied by the ATC Subcontractor.
    - b. Provide, on magnetic starter furnished, all necessary auxiliary contracts, with buttons and switches in required configurations.
    - c. Provide necessary blank-off plate (safing) required to install dampers that are smaller than duct size.
    - d. Provide access doors or other approved means of access through ceiling and walls for service to control equipment.
  - 2. The Electrical Subcontractor shall:
    - a. Provide all power wiring (110 VAC or greater) to motors.

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### 1.05 ELECTRIC WIRING

- A. All electric wiring, wiring, connections and all interlocking required for the installation of the temperature control system, as herein specified, shall be provided by the ATC Subcontractor, unless specifically shown on the Electrical drawings or called for in the Electrical specifications. Power to valves and actuators shall be by the ATC Subcontractor, except as specifically noted in the Electrical drawings and specifications.
- B. All wiring shall comply with the requirements of the Electrical Section of the specifications.

### 1.06 SUBMITTAL BROCHURE

- A. The following shall be submitted for Approval:
  - 1. Control drawings with detailed piping and wiring diagrams, including bill of material and a written sequence of operation for each system controlled by the ATC Contractor. Diagrams shall include individual wiring and tubing marking designation, interlock details and wiring details of interfaces to other manufacturers system.
  - 2. A symbol key and an overall LAN Architecture Diagram.
  - 3. Panel layouts and nameplate lists for all local and central panels.
  - 4. Valve schedules showing size, configuration, capacity and location of all equipment.
  - 5. Data sheets for all control system components.
  - 6. Control strategies (software flow charts) must be included within the second ATC shop drawing submittal. The listing of each strategy must be in English and demonstrate the desired ATC sequence of operation. Submittal must be complete with proposed schedules, listing of setpoints and end device point listing and addresses.

### 1.07 GUARANTEE

- A. The system specified herein and shown on the drawings shall be guaranteed to be free from original defects in both material and workmanship and shall perform to manufacturer specification for a period of one (1) year of normal use and service, excepting damages from other causes. Systems which are manufactured ISO-9001 certification are preferred. This guarantee shall become effective starting the date the Contract work is accepted as complete by the Owner and in accordance with the General Provisions/Conditions.
- B. Upon completion of the installation, the ATC Subcontractor shall submit to the Owner an agreement to provide the necessary programmed maintenance, to keep the various control systems in proper working condition beyond the guarantee period. Additionally, this contractor shall submit to the owner its standard agreement to support the system operation. This service must include operators support, application support, remote diagnostic support as well as database management support. This service shall be available 365 days/year, 24 hours a day.
- C. This programmed maintenance agreement shall fully describe the maintenance work to be performed and shall advise as to the cost of this work prior to awarding of Contract.

1.08 INSTRUCTION AND ADJUSTMENT

- A. Upon completion of the project, the ATC Subcontractor shall:
1. Fine-tune and “de-bug” all software control loops, routines, programs and sequences of control associates with the control system supplied.
  2. Completely adjust and make ready for use, all transmitters, relays, valves, etc., provided under this Section. This contractor shall furnish copies of complete, detailed, calibrating checkout and commissionary documentation for each controller. Documentation shall list each procedure and shall be signed by the control specialist performing the service.
  3. Furnish a complete set of system operation manuals, including standard manufacturers’ operating manuals, complete as-built installation diagrams, and complete software hardcopy documentation, as well as a magnetic media back-up.
  4. Provide an on-site training program for the Owner’s staff in the operation and use of the control system. Training shall include two (2) segments, as follows:
    - a. Segment 1 shall include 4 hours of classroom and hands-on training. This segment shall instruct personnel in the system configuration, component characteristics, control strategy on each controlled system and all requirements for daily operation and use of the system. This segment shall give the Owner’s representative a working proficiency in the day-to-day operational requirements (i.e., system monitoring, alarm acknowledgment, HVAC system troubleshooting techniques, set point and time schedule adjustments, manual override, etc.).
    - b. Segment 2 shall include 8 hours of onsite training. This segment will be geared for the Owner’s designated prime operator. An emphasis on overall software management and manipulation shall be made, to allow the prime operator(s) to make control strategy and overall facility and system management changes as required. Attendees shall have attended Segment 1.
    - c. All training shall take place at the site and at times mutually agreed to between the ATC Subcontractor and the Owner. The ATC Subcontractor shall provide to the Owner’s designated representative, at least three (3) weeks before each segment, a course syllabus outline and schedule. The ATC Subcontractor shall provide all training material, reference material and training aids, as required, all as part of his Contract cost.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. General
1. The system shall be comprised of network of Stand-Alone controllers. Controls for each system shall be provided as described in the sequences of operation and shall interface to the with the control equipment specification.

2.02 AUTOMATIC CONTROL VALVES

- A. Control valves shall be two-way pattern as shown, constructed for tight shut off and shall operate satisfactorily against system pressures and differentials. Two-way control valves shall exhibit equal percentage characteristics. Valves with size up to and including 2" shall be screwed with 250 psi ANSI pressure body rating; 2 1/2" and larger valves shall be flanged configuration. Proportional control valves shall be sized for a maximum pressure drop of 4.0 psig at rated flow (except as noted). Two-position control valves shall be line size and shall be provided with a 250 psi static pressure body rating.
- B. All valves shall be capable of operating in sequence when required by the sequence of operation. All control valves shall be sized by the control manufacturer and shall be guaranteed to meet heating and cooling loads specified.
- C. All control valves shall be suitable for the pressure conditions and shall close against the differential pressure involved. Valve operator connection type (screwed or flanged) shall conform to pipe system.
- D. All valves sequenced with other valves, or control devices, shall be equipped with pilot positioners or panel mounted positive positioning relays to ensure proper control sequencing.
- E. Chilled and Hot water control valves shall be single seated type with equal percentage flow characteristics, normally closed. The valve discs shall be composition type with bronze trim.
- F. Valves shall be sized on the exact pressure drop for the equipment served to prevent over or under sizing the valves. Provide a separate submittal with all of this information included.

2.03 PRESSURE SWITCHES

- A. The pressure switches shall meet but not be limited to the following specifications:
  - 1. Sensing elements shall be capsule, diaphragm, bellow, bourdon tube, or solid state capable of withstanding 150% of rated pressure (sensor).
  - 2. Switch actuation shall be adjustable for the specified application.
  - 3. Switch shall have snap-action Form C contact rated for the application.
  - 4. Gauge pressure switches shall have adjustable differential settings.
  - 5. Accuracy of  $\pm 1\%$  of the switch setting.

2.04 FLOW SWITCHES

- A. Flow switches shall meet but not be limited to the following specifications:
  - 1. Repetitive accuracy of  $\pm 1\%$  of operating range.
  - 2. Switch actuation adjustable over the operating flow range.

2.05 MISCELLANEOUS CONTROL PANELS

- A. Details of each panel shall be submitted for review prior to fabrication. Locations of each panel shall be convenient for adjustment and service. Provide engraved nameplate beneath each panel mounted control device clearly describing the function of said device and range of operation. All manual switches shall be flush mounted on the hinged door.

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- B. All electrical devices within the panels shall be factory pre-wired to a numbered terminal strip. All wiring within the panel shall be in accordance with NEMA and UL Standards and shall meet all Local Codes.

### 2.06 VARIABLE FREQUENCY DRIVES (VFD)

- A. Provide two combination VFD / starters for the AHU's. Unit shall be manufactured by ABB, Danfoss or Emerson.
- B. Unit shall have the following options:
  - 1. NEMA 1 type enclosure.
  - 2. Operating temperature range 32 deg F – 104 deg F.
  - 3. 5% Input AC and DC Line Reactor (meeting National Grids Rebate Incentive Program).
  - 4. HOA (Hand / Off / Auto) Switch and manual/automatic.
  - 5. Potentiometer (0-100%).
  - 6. Bypass with service switch.
- C. This unit is intended to be mounted indoors only.

## PART 3 - EXECUTION - SEQUENCE OF OPERATION

### 3.01 GENERAL

- A. Provide controls to make systems function in accordance with good practice considering energy conservation and actual intended use for all equipment that is not covered by these descriptions. All starters shall have HAND/OFF/AUTO function. Label all starters with phenolic nameplates indicating equipment serviced.

### 3.02 SEQUENCE OF OPERATION

- A. AIR HANDLING UNIT (G-AHU-3) and REMOTE RETURN FAN (G-RAF-1):
  - 1. This unit is provided with outdoor, return and relief air dampers, chilled water coil, hot water coil and remote return fan. Supply and return fans shall run together (via VFD) as required to provide scheduled airflows.
  - 2. Unoccupied - The outside air damper shall be closed, the return damper shall be open and the unit shall cycle the two-way heating or chilled water control valve to maintain return air temperature of 65°F (ADJ.). Return air sensor to be located in the return air duct main in the mechanical room.
  - 3. Morning Warm-Up - The fans shall run continuously (subject to safeties) and the outside air damper shall be closed (return damper open to 100%). The outside air damper shall remain closed until return air temperature is satisfied (72°F. ADJ). The heating coil shall modulate to maintain return air temperature as required.
  - 4. Occupied Heating - The fans shall run continuously (subject to safeties) and the outside air damper shall be open to set position. The heating coil shall modulate to maintain return air temperature as required.
  - 5. Occupied Cooling - The fans shall run continuously (subject to safeties) and the outside air damper shall be open to set position. If the space is calling for cooling, the two-way control valve (2-position – open / closed) shall cycle to maintain return air temperature set point of 72°F (ADJ) in summer months or reset discharge air temperature of 65°F (ADJ) in the winter months.

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6. Dehumidification – Provide a humidity sensor in the space served by this unit. Upon detection of high humidity, the system shall be capable of dehumidification control. During this sequence, the unit shall be controlled as follows. Cycle the chilled water valve to maintain a discharge coil temperature of 55°F and modulate the hot water control valve to maintain return air temperature of 72°F (ADJ).
  7. Enthalpy Economizer (Free Cooling) Mode - If the space is calling for cooling and the outside air enthalpy sensor determines that the outside air is suitable for cooling, the unit shall utilize economizer cooling.
  8. Outside Air Sensing - If the space is calling for cooling and the outside air enthalpy sensor determines that the outside air is suitable for cooling, the unit shall utilize economizer cooling, by modulating return and outdoor air dampers to maintain return air temperature setpoint of 72°F (ADJ.).
  9. Demand Ventilation Control – A carbon dioxide (CO<sub>2</sub>) sensor shall be provided in the main return air duct to measure carbon dioxide levels in the return airstream. The outdoor and return air dampers shall modulate to maintain adequate levels of CO<sub>2</sub> in the return airstream.
  10. Provide an outside air temperature and humidity sensor with sunshield to index the heating cooling mode and the economizer dampers.
  11. Freezestat located at the inlet of the hydronic coils shall sense the temperature at the coil. Upon detection of air less than 36°F, the unit shall stop, shutdown the outside air damper, open the return air damper, shut down any associated fans and initiate an alarm.
  12. Safety Controls: Provide the following:
    - a. Provide filter differential pressure gage at each filter bank.
    - b. Smoke Detector: Stop fan and send signal to building fire alarm system.
    - c. CO<sub>2</sub> levels – actual level and high limit alarm.
    - d. Humidity level.
- B. AIR HANDLING UNIT (G-AHU-1,2) and REMOTE RETURN FANS (G-RAF-2A & 2B):
1. This unit is provided with outdoor, return and relief air dampers, chilled water coil, (2) remote hot water coils and remote return fans. Supply and return fans shall run together as required to provide scheduled airflow. Due to the mixed air temperature at the filter / mixing box, no heating coil is required.
  2. Unoccupied - The outside air damper shall be closed, the return damper shall be open and the unit shall cycle the two-way heating or chilled water control valve to maintain return air temperature of 65°F (ADJ.). Return air sensor to be located in the return air duct in the mechanical room.
  3. Morning Warm-Up - The fans shall run continuously (subject to safeties) and the outside air damper shall be closed (return damper open to 100%). The outside air damper shall remain closed until return air temperature is satisfied (72°F. ADJ). The heating coil shall modulate to maintain return air temperature as required.
  4. Occupied Heating - The fans shall run continuously (subject to safeties) and the outside air damper shall be open to set position. The heating coil shall modulate to maintain return air temperature as required.

5. Occupied Cooling - The fans shall run continuously (subject to safeties) and the outside air damper shall be open to set position. If the space is calling for cooling, the two-way control valve (2-position – open / closed) shall cycle to maintain return air temperature set point of 72°F (ADJ) in summer months or reset discharge air temperature of 65°F (ADJ) in the winter months.
  6. Dehumidification – Provide a humidity sensor in each space served by this unit (2 required). Upon detection of high humidity, the system shall be capable of dehumidification control. During this sequence, the unit shall be controlled as follows. Cycle the chilled water valve to maintain a discharge coil temperature of 55°F and modulate the dedicated remote hot water control valve to maintain return air temperature of 72°F (ADJ).
  7. Enthalpy Economizer (Free Cooling) Mode - If the space is calling for cooling and the outside air enthalpy sensor determines that the outside air is suitable for cooling, the unit shall utilize economizer cooling.
  8. Outside Air Sensing - If the space is calling for cooling and the outside air enthalpy sensor determines that the outside air is suitable for cooling, the unit shall utilize economizer cooling, by modulating return and outdoor air dampers to maintain return air temperature setpoint of 72°F (ADJ.).
  9. Demand Ventilation Control – A carbon dioxide (CO<sub>2</sub>) sensor shall be provided in the main return air duct to measure carbon dioxide levels in the return airstream. The outdoor and return air dampers shall modulate to maintain adequate levels of CO<sub>2</sub> in the return airstream.
  10. Provide an outside air temperature and humidity sensor with sunshield to index the heating cooling mode and the economizer dampers.
  11. Emergency Cycle – Provide an emergency “button” (red and noticeable – labeled emergency purge alarm) located in the Prisoner Dispatch Area (where the Guard is present and seated). Upon activation of this alarm (manual by the Prisoner Guard), all outdoor air dampers serving G-AHU-3 and 1,2 shall be closed and return air fan G-RAF-2a shall exhaust all airflow from this area to the outdoors. Provide an audible alarm at the Guard Station and an alarm condition at the front end computer.
  12. Freezestat located at the inlet of the hydronic coils shall sense the temperature at the coil. Upon detection of air less than 36°F, the unit shall stop, shutdown the outside air damper, open the return air damper, shut down any associated fans and initiate an alarm.
  13. Safety Controls: Provide the following:
    - a. Provide filter differential pressure gage at each filter bank.
    - b. Smoke Detector: Stop fan and send signal to building fire alarm system.
    - c. CO<sub>2</sub> levels – actual level and high limit alarm.
    - d. Humidity level.
    - e. Emergency Cycle Alarm
- END OF SECTION

SECTION 15990

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 CONTRACTUAL MATTERS

- A. Mechanical contractor shall coordinate all work with balancing contractor.
- B. This specification section does not define or establish the extent of work performed by sub-trades.

1.02 QUALITY ASSURANCE

- A. This specification section does not define or establish the extent of work performed by sub-trades. Contractor shall assign sub-trade work as he deems appropriate for a complete, coordinated, cost effective, and proper execution.

1.03 GENERAL

- A. Provide qualified personnel, equipment, apparatus and services for start-up, testing and balancing of mechanical systems, to performance data shown on Schedules, as specified, and as required by codes, standards, regulations and authorities having jurisdiction including City Inspectors, Owner and Architect.
- B. Start-up, testing and balancing shall not diminish guarantee requirements.
- C. Notify engineer, manufacturer's representative and authorities involved at least two weeks before start-up, testing, and balancing begins.
- D. Instruments for testing and balancing shall have been calibrated within 6 months prior to testing or balancing. Calibration shall be certified.
- E. Upon completion of work, submit written guarantee stating that environmental systems have been tested, adjusted and balanced.
- F. This section includes:
  - 1. Testing adjustment and balancing of air systems.
  - 2. Measurement of final operating conditions of HVAC systems.
  - 3. Testing, adjustment and balancing of hydronic systems
  - 4. Testing adjustment and balancing of domestic water systems.
  - 5. Duct air leakage, tests and reports.

1.04 REFERENCES

- A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.
- B. ASHRAE - 1984 System Handbook: Chapter 37, Testing, Adjusting and Balancing.
- C. NEBB - National Environmental Balancing Bureau.
- D. SMACNA - Manual for the Balancing and Adjustment of Air Distribution System.

1.05 SUBMITTALS

- A. Submit four draft copies of report for review prior to final acceptance of project. Provide five final copies for engineer and for inclusion in operating and maintenance manuals.
- B. Report forms shall include the following information:
  - 1. Title Page.
    - a. Company name
    - b. Company address
    - c. Company telephone number
    - d. Project name
    - e. Project location
    - f. Project Architect
    - g. Project Engineer
    - h. Project Contractor
    - i. Project altitude
  - 2. Instrument list.
    - a. Instrument
    - b. Manufacturer
    - c. Model
    - d. Serial number
    - e. Range
    - f. Calibration date
  - 3. Fan data.
    - a. Location
    - b. Manufacturer
    - c. Model
    - d. Airflow, specified and actual
    - e. Total static pressure (total external), specified and actual
    - f. Inlet pressure
    - g. Discharge pressure
    - h. Fan RPM.
  - 4. Electric motors.
    - a. Manufacturer
    - b. HP/BHP
    - c. Phase, voltage, amperage; nameplate, actual, no load
    - d. RPM
    - e. Service factor
    - f. Starter size, rating, heater elements
  - 5. AHU data.
    - a. Location
    - b. Manufacturer
    - c. Model
    - d. Airflow, specified and actual
    - e. Total static pressure (total external), specified and actual
    - f. Inlet pressure
    - g. Discharge pressure

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- h. Fan RPM.
- i. Chilled water coil GPM and Pressure Drop
- j. Hot water coil GPM and Pressure Drop

### 1.06 PROJECT CONDITIONS

- A. Testing, adjusting and balancing shall be performed on all new mechanical equipment.

### 1.07 SEQUENCING AND SCHEDULING

- A. Related requirements: Section 15900
- B. Sequence work to commence after completion of systems and schedule completion of work before substantial completion of each phase of the project.
- C. Coordinate the scheduling and sequencing with the general contractors.

## PART 2 - PRODUCTS

### 2.01 AIR AND WATER BALANCING

- A. Provide the complete balancing and adjusting of all air systems including the following.
  - 1. Adjusting fan speeds including resheaving if required. New sheaves shall be part of the base bid and shall not require additional compensation if required.
  - 2. Test and record all motor currents and nameplate data.
  - 3. Test and adjust each diffuser, grille and register to within 10% of design requirements. Method of testing shall be in accordance with balancing references.
  - 4. List design and measured air velocities and quantities, fan speeds, static pressures, and motor amperage.
  - 5. Conduct leak test on all ductwork.
- B. Provide complete balancing and adjusting of all water systems including the following.
  - 1. Test and adjust flow at each coil.
  - 2. List design and measured flows and temperatures.
- C. Test and balancing contractor shall be a contractor specializing in the testing and balancing of HVAC systems. All work shall be in accordance with balancing references.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Before commencing work, verify that systems are complete and operable. Ensure the following:
  - 1. Equipment is operable and in a safe and normal condition.
  - 2. Temperature control systems are installed complete and operable.
  - 3. Proper thermal overload protection is in place for electrical equipment.
  - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
  - 5. Duct systems are clean of debris.
  - 6. Correct fan rotation.
  - 7. Fire and volume dampers are in place and open.
  - 8. Coil fins have been cleaned and combed.
  - 9. Access doors are closed and duct end caps are in place.

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10. Air outlets are installed and connected.
  11. Duct system leakage has been corrected and retested to be within limits specified..
  12. Hydronic systems have been flushed, filled and vented.
  13. Proper strainer baskets are clean and in place.
  15. Service and balance valves are open.
- B. Report any defects or deficiencies noted during performance of services to Owner/Engineer prior to final balancing.
- C. Promptly report abnormal conditions in mechanical systems or conditions which prevent system balance.
- D. If, for design reasons, system cannot be properly balanced, report as soon as observed.
- E. Beginning of work means acceptance of existing conditions.
- F. Rebalance, at no additional expense to Owner, environmental systems found to be operating outside design limits on final inspection.

### 3.02 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Owner/Engineer to facilitate spot checks during testing.
- B. Provide additional balancing devices as required.

### 3.03 INSTALLATION TOLERANCES

- A. Adjust air handling system to plus or minus five percent for supply system, and plus or minus 10 percent for return and exhaust systems from figures indicated.

END OF SECTION

SECTION 16100

ELECTRICAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. The General Conditions, Supplementary Conditions, and applicable portions of Division 1 of the specification are part of this section which shall consist of all labor, equipment, materials and other costs necessary to complete all **electrical** work indicated on the drawings, herein specified or both.

1.02 DESCRIPTION OF WORK:

- A. The electrical system layouts indicated are generally diagrammatic and locations of outlets and equipment are approximate only; govern exact routing of wiring and locations of outlets and equipment by structural conditions and obstructions. This is not to be construed to permit redesigning systems. Interconnect as shown. Locate all equipment requiring maintenance and operation so that it will be readily accessible. The right is reserved to make any reasonable change in location of outlets and equipment prior to roughing-in without involving additional expense. This may involve slightly longer wiring runs, longer stems, additional mounting provisions, etc. Allow for this in your bid because additional compensation will not be provided. Items not specifically located on the plans shall (for the purposes of bidding) be assumed to be in the farthest, most difficult location. Exact location to be as directed by the Engineer in the field. Provide all systems complete. Drawings and Specifications form complementary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation. All wiring and connections to be done with associated circuit de-energized. The word "provide" is hereby defined to mean, "furnish and install." The word "wiring" is hereby defined to mean "wire, raceway, boxes and fittings." The work includes, but is not limited to the following:

1. Power and lighting system including distribution equipment, feeders, branch circuits, wiring devices, lighting fixtures, lamps, exit signs, etc.
2. Final connections to equipment requiring power.
3. Fire alarm system extension
4. Removals and relocations

1.03 RELATED WORK SPECIFIED UNDER OTHER SECTIONS: (Read these sections carefully. For purposes of bidding, assume that all work of the DIVISION referenced is to be performed under that DIVISION unless specifically indicated therein to be performed under the ELECTRICAL DIVISION.)

- A. Furnishing of magnetic starters for HVAC equipment - see DIVISION 15.
- B. Temperature controls, temperature control wiring, and interlock wiring, (except as indicated on the electrical drawings) - see DIVISION 15.

1.04 QUALITY ASSURANCE:

- A. Shop Drawings and Product Data:
  1. Submit catalog data or drawings of the following equipment for final approval:
    - a. Circuit Breakers

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- b. Wire and cable
  - c. Receptacles and cover plates
  - d. Fire alarm devices
2. Where the drawings or specifications list specific brands or catalog numbers, only these products may be used unless the words: "or approved equal" are included.
  3. It is the responsibility of the Contractor to check all dimensions and details on shop drawings, before submission to the Engineer, reject same if necessary and only forward to the Engineer shop drawings which he is reasonably certain fulfill the requirements of the contract documents and the work. The approval of shop drawings by the Engineer shall be general only in character and not mean dimensions on drawings have been checked, and will in no way relieve the Contractor of the responsibility for proper fitting and construction of the work, nor from the necessity of furnishing materials or doing the work required by the drawings and/or specifications, which may not be indicated on the shop drawings when approved. All shop drawings shall be checked by the Contractor, and must bear the Contractor's stamp of approval. At a minimum, the contractor shall state in writing that he has "checked and approved shop drawings for compliance and coordination". Drawings submitted without this stamp of approval will not be considered.
  4. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation, in a separate cover letter on Contractor's letterhead, at the time of submittal and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer's approval thereof.
- B. Samples: Provide all samples requested by the Engineer.
  - C. Tests: Test the complete installation to prove it free from shorts, grounds, opens and faulty connections. Make any corrections necessary before acceptance.
  - D. Test each function of each system including each device.
  - E. Settings: Provide list of recommended settings of adjustable circuit breakers, ground fault protection, etc., where needed.
  - F. Certification: Upon request, provide "Certification" (by a recognized testing agency or a Professional Engineer registered in the state that the project is located in) that submitted items of equipment are suitable for their intended use.
  - G. Record of Addenda and Change Orders: To avoid overlooking addenda and change order modifications, mark all changes on all copies of drawings and specifications, in a manner acceptable to the Engineer. One method of accomplishing this is to make copies and tape them on the back of the preceding page (tape all edges). Also, circle the changed area and note: see addenda #1, etc. If whole pages or sheets change, either remove the superseded document or put a bold "X" through it.
  - H. Record Drawings: Owner's record drawings shall be updated as the project progresses. Maintain documents in a safe, dry location. Indicate clearly and accurately any changes necessitated by field conditions and dimension all raceways built into or under concrete slabs or buried under ground.
  - I. As-Built Drawings: Contractor to prepare as-built drawings in CAD format at contractor's expense. Contract drawings in CAD format to be furnished to contractor at no cost to contractor. Contractor to provide two compact discs and two hard copies of final as-built drawings.

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- J. Operating Instructions and Manuals: Provide the Owner or his representative with complete operating instructions by qualified personnel of all electrical systems. Provide three (3) bound sets (indexed and bound in three sturdy three-ring binders) of operating and maintenance instructions of all electrical systems employed and all shop drawings.
- K. Manuals: Provide one (1) extra bound set of all shop drawings. Bind in a sturdy 3-ring binder.
- L. Letter of Confirmation: Include in the above manuals a letter confirming that the following items have been completed.
  - 1. Keys have been provided for all locked electrical equipment.
  - 2. The provisions of the "Operating Instructions and Manuals" paragraph of these specifications have been met.
  - 3. Spare fuses have been provided.
  - 4. Identification is complete and in accordance with these specifications.
  - 5. As-built electrical drawings have been completed and submitted.
  - 6. All tests are complete and in accordance with these specifications.
  - 7. All required shop drawings have been submitted and approved.
  - 8. The entire installation has been accepted by all authorities.

### 1.05 PERMITS AND FEES:

- A. Obtain all permits for the work of this section.
- B. Pay all fees, including a FIRE ALARM REVIEW FEE and FINAL INSPECTION FEES.

### 1.06 CODES AND STANDARDS:

- A. Do all wiring and provide all equipment in accordance with the prevailing issue of the National Electrical Code, State Building Code, State Fire Safety Code and any additional local rules in force by local inspection authorities. Obtain and pay for all necessary permits, certificates, etc. Present satisfactory proof of final inspection and approval by all inspection authorities.
- B. Consider the following Industry Standards as minimum requirements for all materials, equipment and systems where such standards are established for materials in question:
  - National Board of Fire Underwriters
  - National Electrical Manufacturers Association
  - National Fire Protection Association
  - Institute of Electrical and Electronic Engineers
  - A nationally recognized testing laboratory (UL, ETL, etc.)
  - Factory Mutual
  - Americans with Disabilities Act
- C. All equipment must bear the label of a nationally recognized testing laboratory, acceptable to the Engineer and the authority having jurisdiction.

### 1.07 ELECTRICAL INSTALLATION STANDARDS:

- A. Where applicable, this installation shall comply with the following NECA (National Electrical Contractors Association) "National Electrical Installation Standards." Except, if there is a conflict between this specification and these standards, the requirements of this specification shall prevail.

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NECA 1-2000	Standard Practices for Good Workmanship in Electrical Contracting
NECA 101-2001	Standard for Installing Steel Conduit (Rigid, EMT)
NECA/IESNA 500-1998	Recommended Practice for Installing Indoor Commercial Lighting Systems

1.08 IDENTIFICATION:

- A. Provide typewritten cards, not smaller than 5" x 7" mounted under clear plastic affixed to the inside surface of all door-in-trim panels. Information shall include circuit numbers and type of load served.
- B. Provide typed cardholders to identify each circuit of switchgear and distribution panels. Provide stick-on embossed labels to identify each non-apartment panel, cabinet, and disconnect.
- C. Identification shall include existing panels and equipment modified under this contract.

1.09 SCHEDULING AND SHUTDOWNS:

- A. All work must be scheduled to allow the least interference with the normal operation of the existing facility. Schedule must be arranged to meet the approval of the Owner. All shutdowns of services (power, fire alarm, telephone, etc.) must be approved in writing by the Owner.
- B. All "shutdowns" must be done at other than normal working hours without additional compensation.
- C. All building services (power, fire alarm, telephone, lighting, emergency lighting, exit signs, etc.) must remain in operation during full period of construction. Provide temporary or permanent wiring (if required) to accomplish this.
- D. When an existing fire alarm system is modified or replaced with new, all existing devices must remain in operation until replaced with new devices that are fully tested, approved and operational. All non-functioning equipment shall be so labeled until removed or put into service.

1.10 WORK INTERFERING WITH EXISTING WIRING:

- A. Make any necessary re-circuiting, extensions of existing circuits and relocations required to properly re-energize remaining existing devices or equipment that may be interfered with by new construction or removals.

1.11 REMOVALS AND RELOCATIONS:

- A. Do all removal work in a neat and orderly manner so as not to endanger lives nor cause damage. Removal work to include all associated hangers, couplings, supports, raceway and wiring, etc., and shall be complete in every way.
- B. Remove and dispose of, off-site in a legal manner, all raceways and wire indicated to be removed.
- C. Carefully remove and store on-site, where directed by the Owner, all electrical equipment indicated to be REMOVED. After the Owner has examined this equipment, remove and dispose of, off-site in a legal manner, all of this equipment that the Owner does not want. All remaining equipment shall remain the property of the Owner. Relocate the remaining equipment to a permanent storage location on site where directed by the Owner.

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- D. The electrical removal (demolition) drawings show the general extent of removals. However it is impractical to show every item; some of which may be concealed at the time of the survey. Therefore, assume that you will be required to perform an additional 10% of removal work, without additional compensation. Items not shown to be removed or to remain shall be reviewed with the Engineer prior to removal.
- E. Prior to removing any electrical equipment, properly de-energize all associated wiring. Remove wires from terminals of supply switches or circuit breakers. Properly tape supply and load end conductors of all wiring remaining and not re-used. Properly tag both ends.
- F. Provide outlet boxes, knock-out seals, receptacle cover plates, etc. to leave remaining installation in finished condition.
- G. Take special care in removing equipment indicated to be RELOCATED and properly and thoroughly clean and lubricate this equipment. Renew fuses and overload elements in starters and switches being relocated, if required to properly serve the new installation.
- H. Adjust outlet and junction boxes as required to suit new finished surfaces.
- I. When necessary to perform your work, carefully remove ceiling tiles and properly re-install them. Make sure that hands are clean and take special care to avoid damage. If tiles become damaged, provide new tiles to exactly match existing. If existing tiles have yellowed with age, it may be necessary to relocate existing undamaged tiles from utility spaces (closets, etc.) and install new tiles in their place.
- J. For relocation of lighting fixtures, see section entitled "LIGHTING FIXTURES".

### 1.12 CORE DRILLING:

- A. All holes through masonry surfaces must be "core drilled". This trade (specification section) is responsible for its respective core drilling, if any.
- B. Do not endanger any work by drilling or altering work or any part of it.
- C. Do not drill or alter work of another Contractor without written consent of the Engineer.
- D. Prior to drilling which affects structural safety of project, or work of another Contractor, submit written notice to the Engineer, requesting consent to proceed with cutting.
- E. Core drill residue/water to be concurrently collected via a wet vacuum and disposed of off site. Do not pour down drains.
- F. Perform all work of core drilling to perfectly match the quality as specified throughout these specifications.

### 1.13 SEALING:

- A. Seal around all raceways passing through building surfaces. Fire seal to match rating of building surface.
- B. Penetrations through exterior surfaces shall be made watertight.
- C. Service raceways (power, voice/data, fire alarm, etc.) that contain conductors installed under this contract shall be properly sealed with suitable, pliable sealing compound.

### 1.14 CHANGE ORDERS/PROPOSAL REQUESTS:

- A. During the course of construction, changes in the work may occur. When a significant change is to be made, a Proposal Request will be issued.

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- B. Provide a complete cost breakdown when responding to each Proposal Request.
- C. Each item of work to be priced separately.
- D. Each line item to be broken down including quantities and listing separately labor and material.
- E. Both credits and extras shall be separately and clearly quantified.
- F. Allowances for overhead and profit shall be as listed in the supplementary conditions.
- G. If you become aware of a field condition, code requirement, error, or omission that you feel should result in a change to the work, please contact the Engineer for discussion. The Engineer may be able to clarify the situation and avoid unnecessary paperwork.
- H. It is recognized that the Owner benefits when the construction process is a cooperative effort instead of an adversarial relationship. Reasonable give-and-take allows the construction process to move smoothly. Your efforts in this regard will be appreciated by all parties.

### 1.15 INSPECTIONS/SITE OBSERVATIONS

- A. The authority having jurisdiction (usually the Local Electrical Inspector) shall be notified at periodic intervals that an inspection is requested. Inspections shall be requested at points of progress, meeting the approval of the inspector.
- B. The electrical foreman shall request a meeting with the Engineer within 10 days after the start of electrical construction to assure that there is agreement on the scope of work and to answer questions.
- C. The electrical foreman shall provide assistance to the Engineer during site observations: Describe the progress of the electrical work in detail.
  - 1. Accompany the Engineer on his tour of the site, upon request.
  - 2. Provide use of a suitable ladder, scaffolding or bucket truck to observe the work, upon request.
  - 3. Upon request, remove ceiling tiles, panel trims, junction box covers, etc. for observation of the work.
  - 4. Provide use of project drawings, specifications and shop drawings.

### 1.16 GUARANTEES/WARRANTIES:

- A. See other portions of the Project Manual for details on Guarantees and Warranties. However, minimum shall be one year from date of acceptance by the Engineer.
- B. The Owner reserves the right to make appropriate modifications or extensions of systems and equipment furnished under this contract during the guarantee/warranty period without "voiding" or modifying the guarantee/warranty of equipment and wiring installed under this contract. If manufacturer voids guarantee, it shall not relieve this contractor of his responsibilities for guarantee/warranty period.

## PART 2 - MATERIALS AND EXECUTION

### 2.01 MATERIALS - General:

- A. All materials and equipment to be new unless specifically stated otherwise.

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- B. Materials and equipment shall be suitable for their intended use and for the environment in which they are installed. For example, equipment located outside shall be weatherproof and constructed of materials that will not rust. This includes brackets, screws, etc.
- C. The contractor is responsible for coordinating all dimensions to make sure that boxes, raceways, equipment, fixtures, etc., fit properly in the finished construction. If special provisions, such as shallow boxes, are required, they shall be provided at no increase in contract price, regardless of catalog numbers listed in contract documents or on shop drawings.
- D. As it is not practical to enumerate in these specifications (or show on the drawings) all details of fittings and accessory equipment required for proper operation of the various electrical systems herein described, it is understood that they will be supplied by the contractor without extra compensation. Provide all fittings, terminations, relays, components of panels and equipment, etc., needed for the best performance possible at the present state-of-the-art.

2.02 FUSES:

- A. Provide Class J or Class RK1 dual-element, time-delay type fuses. "One-time," "renewable" and RK5 type fuses are not acceptable. Provide one spare set (3) of each size and type used. Where fuse sizes are not indicated, size per N.E.C. Provide Bussmann, Gould or Littlefuse.

FUSE CLASS	LITTLEFUSE	BUSSMANN	GOULD
L	KLPC	KRPC	A4BQ
J	JTD	LPJ	AJT
RK-1	LLSRK/LLNRK	LPSRK/LPNRK	A6D/A2D

2.03 COLOR CODE:

- A. Secondary service, feeders, and branch circuit conductors shall be color-coded as follows:

Phase	208/120 Volts	480/277 Volts
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green
Isolated Ground	Green w/trace ID	Green w/trace ID

- B. Permanently post at each panel.

2.04 SEQUENCE AND BALANCE:

- A. Maintain correct phase sequence of all feeders and circuits by establishing phase identification and maintaining correct relationship throughout the system. Provide line balance within 10% of normal loads.

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### 2.05 GROUNDING:

- A. Thoroughly bond and ground all metallic equipment including conduits, enclosures, and metallic supports, all in full conformance with the National Electric Code and local requirements.
- B. Provide a separate green equipment ground wire in all raceways.

### 2.06 WIRING:

- A. Provide wiring THWN, XHHW, or approved equal, rated 90 degrees C minimum and suitable for wet and dry locations.
- B. Use all copper wire. Aluminum wire is not acceptable.
- C. In other locations, use rigid galvanized threaded conduit (in damp or wet locations), EMT or type MC cable (concealed in walls and above ceilings). Do not use type AC or NM cable. EMT couplings and connectors shall be steel. Die-cast are not acceptable.
- D. Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacity shall be reduced per NEC table based on no diversity. Consider neutrals to be current carrying conductors.
- E. Provide final connection to all motors, transformers and equipment in liquid-tight flexible conduit. Provide 12 inch maximum length with a grounding conductor. Construct of continuous interlocking bands of zinc-coated steel with an outer covering forming a liquid-tight jacket.
- F. Expansion fittings shall be provided in all raceways, if and where required.
- G. For equipment furnished with a cord and plug, provide a matching receptacle. For direct connected equipment, provide final connection.
- H. Wiring connections to equipment shall include connections to all accessories. For example, if a fan has an associated damper, the wiring must be extended from the fan to the damper at no additional charge. Another example is interconnection of equipment. Some items of equipment consist of several pieces, which must be interconnected before connecting to the circuit. No additional compensation will be paid for this.
- I. All cables installed under this contract are to be protected from damage prior to installation, during installation and after installation. Store cable in a dry area protected from physical damage. Before installing cable, raceway to be clear, dry and free from burs or sharp edges.
- J. See FIRE ALARM SYSTEM for fire alarm wiring.

### 2.07 CONNECTIONS

- A. Make all final connections required for a complete and fully operational facility.
- B. Wiring connections to equipment shall include connections to all accessories. For example, if a fan has an associated damper, the wiring must be extended from the fan to the damper at no additional charge. Another example is interconnection of equipment. Some items of equipment consist of several pieces, which must be interconnected before connecting to the circuit. No additional compensation will be paid for interconnections.

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- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486 B.
- D. Avoid splices and taps, where feasible. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- E. Locations of junction boxes, stub-ups and disconnects are diagrammatic. At the time of design, the exact brand of equipment is usually not known. Therefore, the exact locations of connections are not known. For the purposes of bidding assume the worst, farthest locations. During construction, coordinate connections with final approved shop drawings and coordinate with other trades. Conform to manufactures written installation instructions. Provide working space in compliance with code.

2.08 OUTLET BOXES:

- A. Provide galvanized steel outlet boxes of the size and type required.

2.09 RECEPTACLES:

- A. Provide 20 amp. commercial specification grade, grounded, ivory duplex receptacles. Provide additional receptacles to suit the particular equipment served.

20A/125V	Duplex Receptacle	GE #GCR-20
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- B. The above catalog numbers indicate type and quality. Manufacturer to be General Electric Company, Arrow, Bryant, Hubbell, Leviton or P&S.

2.10 COVER PLATES:

- A. Provide stainless steel receptacle cover plates with brushed finish. (Type 302) Engrave each receptacle cover plate with panel designation and circuit number. (Brother P-Touch labeling system is acceptable, in lieu of engraving). Also, include this information on a cardboard tag attached to the wires inside the outlet box.

2.11 SLEEVES, BOXES AND CONCEALED CONDUIT:

- A. Provide all sleeves that will be required for the installation of wiring through walls, floor etc., including all systems.
- B. See that the outlet boxes, switch boxes, junction boxes and conduits designated for installation in or under floors or walls are placed at such times as may be necessary in order to expedite the construction of the building.

2.12 HVAC & PLUMBING:

- A. Provide all wire, conduit, boxes and fittings for all HVAC equipment and final connections.
- B. Examine DIVISION 15 carefully for any work specified as performed under this Section and coordinate.
- C. Provide all disconnects.
- D. Provide nameplates on all disconnects.

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- E. Automatic starters and manual starters (thermal toggle switches) to be furnished under DIVISION 15 and installed and wired (both sides) under this Section. Some starters may be variable frequency drive (VFD) type and may have built-in disconnects. Provide wiring on both sides. Some VFD's are large and heavy. Provide adequate mounting and proper working space.
- F. Temperature controls are provided under DIVISION 15. Temperature control wiring, interlock wiring, and boiler control wiring are provided under DIVISION 15, except as shown on the electrical drawings or indicated differently herein.
- G. Control valves and transformers for all heating units are furnished and installed under DIVISION 15.
- H. Do not use electrical drawings for location of feeds to mechanical equipment. In general, use mechanical drawings for bidding purposes and final approved mechanical shop drawings for actual installation. However, report any discrepancies to mechanical and electrical engineer for final determination, prior to installation.

### 2.13 FIRE ALARM SYSTEM:

- A. General:
  - 1. Provide an addition and modification to the existing automatic and manual, auxiliary connected fire alarm system, according to the following specifications to be wired, connected, tested and left in first class operating condition. All equipment shall be Underwriters' Laboratories approved for the intended use and shall meet with the approval of the local authority. The complete system match existing.
  - 2. Replace any existing equipment and wiring that is not compatible with the equipment that you provide or the modifications that you make, without additional compensation.
  - 3. Modify the control panel and add additional components as necessary to provide a fully functional fire alarm system in compliance with all current codes. All control panel components must be one manufacturer. This also includes modifications and equipment necessary to accomplish functions specified in other sections, such as elevator capture.
  - 4. As it is not practical to enumerate in these specifications all details of fittings and accessory equipment required for proper operation of the system herein described, it is understood that they will be supplied by the contractor without extra compensation. Provide all fittings, terminations, etc., needed for the best performance possible at the present state-of-the-art.
- B. Quality Assurance:
  - 1. Equipment and materials shall be supplied by an authorized and factory trained Distributor of the manufacturer within the territory of the project location. It will be the responsibility of the supplier to ensure proper specification adherence for system operation, final connection, test, turnover, warranty compliance, and after-market service.
  - 2. To assure prompt service, the equipment supplier's facility must be located within 50 miles of the project site. It shall not be sufficient to merely have an employee who happens to live nearby.
  - 3. All installation and maintenance personnel must be employees of the equipment supplier certified and factory trained for the provided equipment and must be licensed by the state covering fire alarm systems.

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### C. Submittals:

1. Submit shop drawings to and obtain written approval from the authority having jurisdiction, prior to ordering fire alarm equipment and prior to installation of wiring and equipment. General requirements are as follows:
  - a. Manufacturer's original catalog data and description information shall be supplied for all major components of the equipment to be supplied.
  - b. Supplier's qualifications indicating years in business, service policies, warranty definitions, and a list of similar installations.
  - c. Contractor's qualifications indicating years in business, prior experience with installations that include the type of equipment that is to be supplied, Rhode Island License # and type of license.

### D. Equipment:

1. Provide equipment as indicated on the drawings.

### E. Wiring:

1. The electrical subcontractor shall provide in accordance with manufacturer's instructions, all wiring, conduit and outlet boxes required for installation of a complete system as described herein and as shown on the plans. Provide all wiring in metallic raceway. Provide No. 14 gauge, THWN, solid conductors and color code as required.
2. Tag all wires at all junction points and test free from grounds or crosses between conductors. Carry the wiring system through all equipment. Provide red painted terminal cabinets with hinged lockable covers at all junction points. Make all conductor splices on screw type terminal blocks; wire nuts shall not be used. Properly label all terminals within terminal cabinets. Make final connections between control equipment and the wiring system under direct supervision of a representative of the manufacturer.

### F. Guarantee and Final Test:

1. Guarantee all new equipment and wiring to be free from inherent mechanical and electrical defects for a period of one year from the date of final acceptance.
2. Before this installation shall be considered complete and acceptable to the awarding authorities, a complete test on the system shall be performed as follows: The electrical contractor's job foreman, in the presence of a representative of the manufacturer and a representative of the local fire department, shall operate each alarm initiating device and verify zone annunciation, audible and visual signaling and proper operation of the master box. Each circuit shall be opened at its most remote point to check for the correctness of the supervisory circuitry. When the above test has been completed to the satisfaction of the manufacturer's representative, the electrical subcontractor's job foreman, and the local fire department, a letter witnessed and co-signed by all attesting to the completion of this testing shall be forwarded to the Engineer. Test to include both new and existing wiring and equipment.
3. Quarterly testing, as required by the Rhode Island Fire Safety Code is not part of this contract.
4. Service calls resulting from acts of vandalism, acts of nature, or acts which are beyond the control of the equipment manufacturer are excluded under the guarantee and shall be considered a billable call.

END OF SECTION

## APPENDIX C

### RHODE ISLAND JUDICIARY GENERAL TERMS AND CONDITIONS OF PURCHASE

#### *Preamble*

The Judicial Purchasing Office may, from time to time, make amendments to the General Terms and Conditions when the Judicial Purchasing Agent determines that such amendments are in the best interest of the Judiciary. Amendments shall be made available for public inspection at the Office of the Secretary of State but shall not require formal public notice and hearing. Copies of the Terms and Conditions shall be provided to any individual or firm requesting to become a registered bidder. Applicants shall be required, as part of the application process, to certify that they have read the General Terms and Conditions and understand that they apply to all judicial purchases.

#### **JUDICIAL PURCHASING OFFICE GENERAL CONDITIONS OF PURCHASE**

All Judicial purchase orders, contracts, solicitations, delivery orders and service requests shall incorporate and be subject to the provisions of Rhode Island General Laws 8-15-4 and the judicial purchasing rules and regulations adopted pursuant thereto, all other applicable provisions of the Rhode Island General Laws, specific requirements described in the Request or Contract, and the following General Conditions of Purchase:

##### 1. GENERAL

All purchase orders, contracts, solicitations, delivery orders, and service requests are for specified goods and services, in accordance with express terms and conditions of purchase, as defined herein. For the purposes of this document, the terms "bidder" and "contractor" refer to any individual, firm, corporation, or other entity presenting a proposal indicating a desire to enter into contracts with the Judiciary, or with whom a contract is executed by the Judicial Purchasing Agent, and the term "contractor" shall have the same meaning as "Vendor".

##### 2. ENTIRE AGREEMENT

The Judiciary's Purchase Order, or other Judiciary contract endorsed by the Judicial Purchasing Office, shall constitute the entire and exclusive agreement between the Judiciary and any contractor receiving an award. In the event any conflict between the bidder's standard terms of sale, these conditions or more specific provisions contained in the solicitation shall govern.

All communication between the Judiciary and any contractor pertaining to any award or contract shall be accomplished in writing.

a. Each proposal will be received with the understanding that the acceptance, in writing, by contract or Purchase Order by the Judicial Purchasing Agent of the offer to do work or to furnish any or all the materials, equipment, supplies or services described therein shall constitute a contract between the bidder and the Judiciary. This shall bind the bidder on his part to furnish and deliver at the prices and in accordance with the conditions of said accepted proposal and detailed specifications and the Judiciary on its part to order from such contractor (except in case of emergency) and to pay for at the agreed prices, all materials, equipment, supplies or services specified and delivered. A contract shall be deemed executory only to the extent of funds available for payment of the amounts shown on Purchase Orders issued by the Judiciary to the contractors.

b. No alterations or variations of the terms of the contract shall be valid or binding upon the Judiciary unless submitted in writing and accepted by the Judicial Purchasing Agent. All orders and changes thereof must emanate from the Judicial Purchasing Office: no oral agreement or arrangement made by a contractor with an agency or employee will be considered to be binding on the Judicial Purchasing Agent, and may be disregarded.

c. Contracts will remain in force for the contract period specified or until all articles or services ordered before date of termination shall have been satisfactorily delivered or rendered and accepted and thereafter until all terms and conditions have been met, unless:

1. terminated prior to expiration date by satisfactory delivery against orders of entire quantities, or
  2. extended upon written authorization of the Judicial Purchasing Agent and accepted by the contractor, to permit ordering of the unordered balances or additional quantities at the contract price and in accordance with the contract terms, or
  3. canceled by the Judiciary in accordance with other provisions stated herein.
- d. It is mutually understood and agreed that the contractor shall not assign, transfer, convey, sublet or otherwise dispose of this contract or his right, title or interest therein, or his power to execute such contract, to any other person, company or corporation, without the previous consent, in writing, of the Judicial Purchasing Agent.

- e. If, subsequent to the submission of an offer or issuance of a purchase order or execution of a contract, the bidder or contractor shall merge with or be acquired by another entity, the contract may be terminated, except as a corporate resolution prepared by the contractor and the new entity ratifying acceptance of the original bid or contract terms, condition, and pricing is submitted to the Judicial Purchasing Office, and expressly accepted.
- f. The contractor or bidder further warrants by submission of an offer or acceptance of a purchase order or other contract that he has no knowledge at the time of such action of any outstanding and delinquent or otherwise unsettled debt owed by him to the Judiciary, and agrees that later discovery by the Judicial Purchasing Agent that this warranty was given in spite of such knowledge, except where the matter is pending in hearing or from any appeal therefrom, shall form reasonable grounds for termination of the contract.

### 3. SUBCONTRACTS

No subcontracts or collateral agreements shall be permitted, except with the Judiciary's express written consent. Upon request, contractors must submit to the Judicial Purchasing Office a list of all subcontractors to be employed in the performance of any Purchase Order or other contract arising from this Request.

### 4. RELATIONSHIP OF PARTIES

The contractor or bidder warrants, by submission of an offer or acceptance of a purchase order or other contract, that he is not an employee, agent, or servant of the Judiciary, and that he is fully qualified and capable in all material regards to provide the specified goods and services. Nothing herein shall be construed as creating any contractual relationship or obligation between the Judiciary and any sub-bidder, subcontractor, supplier, or employee of the contractor or offeror.

### 5. COSTS OF PREPARATION

All costs associated with the preparation, development, or submission of bids or other offers will be borne by the offeror. The Judiciary will not reimburse any offeror for such costs.

### 6. SPECIFIED QUANTITY REQUIREMENT

Except where expressly specified to the contrary, all solicitations and contracts are predicated on a specified quantity of goods or services, or for a specified level of funding.

- a. The Judiciary reserves the right to modify the quantity, scope of service, date of delivery or completion, or funding of any contract, with no penalty or charge, by written notice to the contractor, except where alternate terms have been expressly made a part of the contract.
- b. The Judiciary shall not accept quantities in excess of the specified quantity except where the item is normally sold by weight (where sold by weight, the Judiciary will not accept quantities greater than ten per cent [10%] of the specified quantity), or where the Request or Contract provides for awards for other than exact quantities.
- c. Purchase Orders or other contracts may be increased in quantity or extended in term without subsequent solicitation with the mutual consent of the contractor and the Judiciary, where determined by the Judicial Purchasing Agent to be in the Judiciary's best interest.

### 7. TERM AND RENEWAL

Where offers have been requested or contracts awarded for terms exceeding periods of twelve (12) months, it is mutually understood and agreed that the Judiciary's commitment is limited to a base term not to exceed twelve (12) months, subject to renewal annually at the Judiciary's sole option for successive terms as otherwise described, except where expressly specified to the contrary. Purchase orders appearing to commit to obligations of funding or terms of performance may be executed for administrative convenience, but are otherwise subject to this provision, and in such cases the Judiciary's renewal shall be deemed to be automatic, conditional on the continued availability of appropriated funds for the purpose, except as written notice of the Judiciary's intent not to renew is served.

### 8. DELIVERY/COMPLETION

Delivery must be made as ordered and/or projects completed in accordance with the proposal. If delivery qualifications do not appear on the bidder's proposal, it will be interpreted to mean that goods are in stock and that shipment will be made within seven (7) calendar days. If the project completion date is not specified in the proposal, the date shall be determined by the Judicial Purchasing Agent. The decision of the Judicial Purchasing Agent, as to reasonable compliance with the delivery terms, and date of completion shall be final. Burden of proof of delay in receipt of order shall rest with the contractor. No delivery charges shall be added to invoices except when authorized on the Purchase Order.

9. FOREIGN CORPORATIONS

In accordance with Title 7 Chapter 1.1 (“Business Corporations”) of the General Laws of Rhode Island, no foreign corporation shall have the right to transact business in this state until it shall have procured a certificate of authority so to do from the Secretary of State.

10. PRICING

All pricing offered or extended to the Judiciary is considered to be firm and fixed unless expressly provided for to the contrary. All prices shall be quoted F.O.B. Destination with freight costs included in the unit cost to be paid by the Judiciary, except, where the Request or Contract permits, offers reflecting F.O.B. Shipping Point will be considered, and freight costs may then be prepaid and added to the invoice.

11. COLLUSION

Bidder or contractor warrants that he has not, directly or indirectly, entered into any agree participated in any collusion or otherwise taken any action in restraint of full competitive bidding. In special circumstances, an executed affidavit will be required as a part of the bid.

12. PROHIBITION AGAINST CONTINGENT FEES AND GRATUITIES

Bidder or contractor warrants that he has not paid, and agrees not to pay, any bonus, commission, fee, or gratuity to any employee or official of the Judiciary for the purpose of obtaining any contract or award issued by the Judiciary. Bidder or contractor further warrants that no commission or other payment has been or will be received from or paid to any third party contingent on the award of any contract by the Judiciary, except as shall have been expressly communicated to the Judicial Purchasing Agent in writing prior to acceptance of the contract or award in question. Subsequent discovery by the Judiciary of non-compliance with these provisions shall constitute sufficient cause for immediate termination of all outstanding contracts and suspension or debarment of the bidder(s) or contractor(s) involved.

13. AWARDS

Awards will be made with reasonable promptness and by written notice to the successful bidder (only); bids are considered to be irrevocable for a period of sixty (60) days following the bid opening unless expressly provided for to the contrary in the Request, and may not be withdrawn during this period without the express permission of the Judicial Purchasing Agent.

- a. Awards shall be made to the bidder(s) whose offer(s) constitutes the lowest responsive price offer (or lowest responsive price offer on an evaluated basis) for the item(s) in question or for the Request as a whole, at the option of the Judiciary. The Judiciary reserves the right to determine those offers which are responsive to the Request, or which otherwise serve its best interests.
- b. The Judiciary reserves the right, before making award, to initiate investigations as to whether or not the materials, equipment, supplies, qualifications or facilities offered by the bidder meet the requirements set forth in the proposal and specification, and are ample and sufficient to insure the proper performance of the contract in the event of award. If upon such examination it is found that the conditions of the proposal are not complied with or that articles or equipment proposed to be furnished do not meet the requirements called for, or that the qualifications or facilities are not satisfactory, the Judiciary may reject such a bid. It is distinctly understood, however, that nothing in the foregoing shall mean or imply that it is obligatory upon the Judiciary to make any examinations before awarding a contract; and it is further understood that if such examination is made, it in no way relieves the contractor from fulfilling all requirements and conditions of the contract.
- c. Qualified or conditional offers which impose limitations of the bidder's liability or modify the requirements of the bid, offers for alternate specifications, or which are made subject to different terms and conditions than those specified by the Judiciary may, at the option of the Judiciary, be
  1. rejected as being non-responsive, or
  2. set aside in favor of the Judiciary's terms and conditions (with the consent of the bidder), or
  3. accepted, where the Judicial Purchasing Agent determines that such acceptance best serves the interests of the Judiciary.

Acceptance or rejection of alternate or counter-offers by the Judiciary shall not constitute a precedent which shall be considered to be binding on successive solicitations or procurements.

- d. Bids submitted in pencil, or which do not bear an original signature, in ink, by an owner or authorized agent thereof, will not be accepted.
- e. Bids must be extended in the unit of measure specified in the Request. In the event of any discrepancy between unit prices and their extensions, the unit price will govern.
- f. The Judicial Purchasing Agent reserves the right to determine the responsibility of any bidder for a particular procurement.
- g. The Judicial Purchasing Agent reserves the right to reject any and all bids in whole or in part, to waive technical defects, irregularities, and omissions, and to give consideration to past performance of the offerors where, in his judgment the best interests of the Judiciary will be served by so doing.
- h. The Judicial Purchasing Agent reserves the right to make awards by items, group of items or on the total low bid for all the items specified as indicated in the detailed specification, unless the bidder specifically indicates otherwise in his bid.
- i. Preference may be given to bids on products raised or manufactured in the State of Rhode Island, other things being equal.
- j. The impact of discounted payment terms shall not be considered in evaluating responses to any Request.
- k. The Judicial Purchasing Agent reserves the right to act in the Judiciary's best interests regarding awards caused by clerical errors by the Judicial Purchasing Office.

#### 14. SUSPENSION AND DEBARMENT

The Judicial Purchasing Agent may suspend or debar any Vendor or potential bidder, for good cause shown:

- a. A debarment or suspension against a part of a corporate entity constitutes debarment or suspension of all of its divisions and all other organizational elements, except where the action has been specifically limited in scope and application, and may include all known corporate affiliates of a contractor, when such offense or act occurred in connection with the affiliate's performance of duties for or on behalf of the contractor, or with the knowledge, approval, or acquiescence of the contractor or one or more of its principals or directors (or where the contractor otherwise participated in, knew of, or had reason to know of the acts).
- b. The fraudulent, criminal or other serious improper conduct of any officer, director, shareholder, partner, employee, or any other individual associated with a contractor may be imputed to the contractor when the conduct occurred in connection with the individual's performance of duties for or on behalf of the contractor, or with the contractor's knowledge, approval or acquiescence. The contractor's acceptance of benefits derived from the conduct shall be evidence of such knowledge, approval, or acquiescence.
- c. A Vendor or contractor who knowingly engages as a subcontractor for a contract awarded by the Judiciary to a Vendor or contractor then under a ruling of suspension or debarment by the Judiciary shall be subject to disallowance of cost, annulment or termination of award, issuance of a stop work order, or debarment or suspension, as may be judged to be appropriate by the Judicial Purchasing Agent.

#### 15. PUBLIC RECORDS

Contractors and bidders are advised that certain documents, correspondence, and other submissions to the Judicial Purchasing Office may be voluntarily made public by the Judiciary absent specific notice that portions of such submittals may contain confidential or proprietary information, such that public access to those items should be withheld.

#### 16. PRODUCT EVALUATION

In all specifications, the words "or equal" are understood after each article when manufacturer's name or catalog are referenced. If bidding on items other than those specified, the bidder must, in every instance, give the trade designation of the article, manufacturer's name and detailed specifications of the item the bidder proposes to furnish; otherwise, the bid will be construed as submitted on the identical commodity described in the detailed specifications. The Judicial Purchasing Agent reserves the right to determine whether or not the item submitted is the approved equal the detailed specifications.

- a. Any objections to specifications must be filed by a bidder, in writing, with the Judicial Purchasing Agent at least 96 hours before the time of bid opening to enable the Judicial Purchasing Office to properly investigate the objections.
- b. All standards are minimum standards except as otherwise provided for in the Request or Contract.
- c. Samples must be submitted to the Judicial Purchasing Office in accordance with the terms of the proposals and detailed specifications. Samples must be furnished free of charge and must be accompanied by descriptive memorandum invoices indicating whether or not the bidder desires their return and specifying the address to which they are to be returned (at the bidder's risk and expense), provided they have not been used or made

useless by tests; and absent instructions, the samples shall be considered to be abandoned. Award samples may be held for comparison with deliveries.

- d. All samples submitted are subject to test by any laboratory the Judicial Purchasing Agent may designate.

#### 17. PRODUCT ACCEPTANCE

All merchandise offered or otherwise provided shall be new, of prime manufacture, and of first quality unless otherwise specified by the Judiciary. The Judiciary reserves the right to reject all nonconforming goods, and to cause their return for credit or replacement, at the Judiciary's option. Contract deliverables specified for procurements of services shall be construed to be work products, and subject to the provisions of this section.

- a. Failure by the Judiciary to discover latent defect(s) or concealed damage or non-conformance shall not foreclose the Judiciary's right to subsequently reject the goods in question.
- b. Formal or informal acceptance by the Judiciary of non-conforming goods shall not constitute a precedent for successive receipts or procurements.
- c. Where the contractor fails to promptly cure the defect or replace the goods, the Judiciary reserves the right to cancel the Purchase Order, contract with a different contractor, and to invoice the original contractor for any differential in price over the original contract price.
- d. When materials, equipment or supplies are rejected, the same must be removed by the contractor from the premises of the Judiciary within forty-eight (48) hours of notification. Rejected items left longer than two days will be regarded as abandoned and the Judiciary shall have the right to dispose of them as its own property.

#### 18. PRODUCT WARRANTIES

All product or service warranties normally offered by the contractor or bidder shall accrue to the Judiciary's benefit, in addition to any special requirements which may be imposed by the Judiciary. Every unit delivered must be guaranteed against faulty material and workmanship for a period of one year unless otherwise specified, and the Judiciary may, in the event of failure, order its replacement, repair, or return for full credit, at its sole option.

#### 19. PAYMENT

Unless otherwise provided for by the Request or Contract, payment shall not be made until delivery has been made, or services performed, in full, and accepted. Payment shall not be due prior to thirty (30) working days following the latest of completion, acceptance, or the rendering of a properly submitted invoice.

- a. Payment terms other than the foregoing may be rejected as being nonresponsive.
- b. No partial shipments, or partial completion will be accepted, unless provided for by the Request or Contract.
- c. Where a question of quality is involved, or failure to complete a project by the specified due date, payment in whole or part against which to charge back any adjustment required, shall be withheld at the direction of the Judicial Purchasing Agent. In the event a cash discount is stipulated, the withholding of payments, as herein described, will not deprive the Judiciary from taking such discount.
- d. Payments for used portion of inferior delivery or late delivery will be made by the Judiciary on an adjusted price basis.
- e. Payments on contracts under architectural or engineering supervision must be accompanied by a Certificate of Payment and Statement of Account signed by the architect or engineer and submitted to the Judicial Purchasing Office for approval.

#### 20. THIRD PARTY PAYMENTS

The Judiciary recognizes no assigned or collateral rights to any purchase agreement except as may be expressly provided for in the bid or contract documents, and will not accede to any request for third party or joint payment(s), except as provided for in specific orders by a court of competent jurisdiction, or by express written permission of the Judicial Purchasing Agent. Where an offer is contingent upon such payment(s), the offeror is obligated to serve affirmative notice in his bid submission.

#### 21. SET-OFF AGAINST PAYMENTS

Payments due the contractor may be subject to reduction equal to the amount of unpaid and delinquent state taxes (or other just debt owed to the State), except where notice of delinquency has not been served or while the matter is pending in hearing or from any appeal therefrom.

#### 22. CLAIMS

Any claim against a contractor may be deducted by the Judiciary from any money due him in the same or other transactions. If no deduction is made in such fashion, the contractor shall pay the Judiciary the amount of such claim on demand. Submission of a voucher and payment, thereof, by the Judiciary shall not preclude the Judicial Purchasing Agent from demanding a price adjustment in any case when the commodity delivered is later found to deviate from the specifications and proposal.

- a. The Judicial Purchasing Agent may assess dollar damages against a Vendor or contractor determined to be non-performing or otherwise in default of their contractual obligations equal to the cost of remedy incurred by the Judiciary, and make payment of such damages a condition for consideration for any subsequent award. Failure by the Vendor or contractor to pay such damages shall constitute just cause for disqualification and rejection, suspension, or debarment.

#### 23. CERTIFICATION OF FUNDING

The Chief Purchasing Officer shall provide certification as to the availability of funds to support the procurement for the current fiscal year ending June 30th only. Where delivery or service requirements extend beyond the end of the current fiscal year, such extensions are subject to both the availability of appropriated funds and a determination of continued need.

#### 24. UNUSED BALANCES

Unless otherwise specified, all unused Blanket Order quantities and/or unexpended funds shall be automatically canceled on the expiration of the specified term. Similarly, for orders encompassing more than one fiscal year, unexpended balances of funding allotted for an individual fiscal year may be liquidated at the close of that fiscal year, at the Judiciary's sole option.

#### 25. MINORITY BUSINESS ENTERPRISES

Pursuant to the provisions of Title 37 Chapter 14.1 of the General Laws, the Judiciary reserves the right to apply additional consideration to offers, and to direct awards to bidders other than the responsive bid representing the lowest price where:

- a. the offer is fully responsive to the terms and conditions of the Request, and
- b. the price offer is determined to be within a competitive range (not to exceed 5% higher than the lowest responsive price offer) for the product or service, and
- c. the firm making the offer has been certified by the R.I. Department of Economic Development to be a small business concern meeting the criteria established to be considered a Minority Business Enterprise. Ten per cent [10%] of the dollar value of the work performed against contracts for construction exceeding \$5,000 shall be performed by Minority Business Enterprises where it has been determined that subcontract opportunities exist, and where certified Minority Business Enterprises are available. A contractor may count towards its MBE, DBE, or WBE goals 60% of its expenditures for materials and supplies required under a contract and obtained from an MBE, DBE, or WBE regular dealer, and 100% of such expenditures when obtained from an MBE, DBE, or WBE manufacturer. Awards of this type shall be subject to approval, by the Chief Purchasing Officer, of a Subcontracting Plan submitted by the bidder receiving the award.

#### 26. PREVAILING WAGE REQUIREMENT

In accordance with Title 37 Chapter 13 of the General Laws of Rhode Island, payment of the general prevailing rate of per diem wages and the general prevailing rate for regular, overtime and other working conditions existing in the locality for each craft, mechanic, teamster, or type of workman needed to execute this work is a requirement for both contractors and subcontractors for all public works.

#### 27. EQUAL OPPORTUNITY COMPLIANCE, HANDICAPPED ACCESS AND AFFIRMATIVE ACTION

Contractors of the Judiciary are required to demonstrate the same commitment to equal opportunity as prevails under federal contracts controlled by Federal Executive Orders 11246, 11625, 11375 and 11830, and Title 28 Chapter 5.1 of the General Laws of Rhode Island.

Affirmative action plans shall be submitted by the contractor for review by the State Equal Opportunity Office. A contractor's failure to abide by the rules, regulations, contract terms and compliance reporting provisions as established shall be grounds for forfeiture and penalties as shall be established, including but not limited to suspension.

#### 28. DRUG-FREE WORKPLACE REQUIREMENT

Contractors who do business with the Judiciary and their employees shall abide by the State's drug-free workplace policy and the contractor shall so attest by signing a certificate of compliance.

29. TAXES

The Judiciary is exempt from payment of excise, transportation and sales tax imposed by the Federal or State Government. These taxes should not be included in the proposal price. Exemption Certificates will be furnished upon request.

30. INSURANCE

All construction contractors, independent tradesmen, or firms providing any type of maintenance, repair, or other type of service to be performed on judicial premises, buildings, or grounds are required to purchase and maintain coverage with a company or companies licensed to do business in the state as follows:

- a. Comprehensive General Liability Insurance
  - 1) Bodily Injury \$1,000,000 each occurrence/ \$1,000,000 annual aggregate
  - 2) Property Damage \$500,000 each occurrence /\$500,000 annual aggregate
- Independent Contractors
  - Contractual - including construction hold harmless and other types of contracts or agreements in effect for insured operations
  - Completed Operations
  - Personal Injury (with employee exclusion deleted)
- b. Automobile Liability Insurance
  - Combined Single Limit \$1,000,000 each occurrence
  - Bodily Injury
  - Property Damage, and in addition non-owned and/or hired vehicles and equipment
- c. Workers' Compensation Insurance
  - Coverage B \$100,000

The Judicial Purchasing Agent reserves the right to consider and accept alternate forms and plans of insurance or to require additional or more extensive coverage for any individual requirement. Successful bidders shall provide certificates of coverage, reflecting the Rhode Island Judiciary as an additional insured, to the Judicial Purchasing Office, forty-eight (48) hours prior to the commencement of work, as a condition of award. Failure to comply with this provision shall result in rejection of the offeror's bid.

31. BID SURETY

When requested, a bidder must furnish a Bid Bond or Certified Check for 5% of his bid, or for the stated amount shown in the solicitation. Bid Bonds must be executed by a reliable Surety Company authorized to do business in the State of Rhode Island. Failure to provide Bid Surety with bid may be cause for rejection of bid. The Bid Surety of any three bidders in contention will be held until an award has been made according to the specifications of each proposal. All others will be returned by mail within 48 hours following the bid opening. Upon award of a contract, the remaining sureties will be returned by mail unless instructed to do otherwise.

32. PERFORMANCE AND LABOR AND PAYMENT BONDS

A performance bond and labor and payment bond of up to 100% of an award may be required by the Judicial Purchasing Agent. Bonds must meet the following requirements:

- a. Corporation: The Bond must be signed by an official of the corporation above his/her official title and the corporate seal must be affixed over his/her signature.
- b. Firm or Partnership: The Bond must be signed by all of the partners and must indicate that they are "Doing Business As (name of firm)."
- c. Individual: The Bond must be signed by the individual owning the business and indicate "Owner."
- d. The Surety Company executing the Bond must be licensed to do business in the State of Rhode Island or Bond must be countersigned by a company so licensed.
- e. The Bond must be signed by an official of the Surety Company and the corporate seal must be affixed over his signature.
- f. Signatures of two witnesses for both the principal and the Surety must appear on the Bond.
- g. A Power of Attorney for the official signing of the Bond for the Surety Company must be submitted with the Bond.

33. SUSPENSION, DEFAULT AND TERMINATION

- a. Suspension of a Contract by the Judiciary

The Judiciary reserves the right at any time and for any reason to suspend all or part of this contract, for a reasonable period, not to exceed sixty days, unless the parties agree to a longer period. The Judiciary shall provide the contractor with written notice of the suspension order signed by the Purchasing Agent or his or her designee, which shall set forth the date upon which the suspension shall take effect, the date of its expiration, and all applicable instructions. Upon receipt of said order, the contractor shall immediately comply with the order and suspend all work under this contract as specified in the order. The contractor shall take all reasonable steps to mitigate costs and adverse impact to the work specified in the contract during the suspension period. Before the order expires, the Judiciary shall either:

1. cancel the suspension order;
2. extend the suspension order for a specified time period not to exceed thirty (30) days; or
3. terminate the contract as provided herein.

The contractor shall resume performance once a suspension order issued under this section is canceled or expires. If as a result of the suspension of performance, there is a financial or schedule impact upon the contract, an appropriate adjustment may be made by, or with the approval of, the Judicial Purchasing Agent. Any adjustment shall be set forth in writing. After a suspension order has been canceled or expires, the contractor shall provide any request for adjustment to the Judicial Purchasing Agent within thirty (30) days after resuming work performance.

- b. Termination of a Contract by the Judiciary
  1. Termination for Default or Nonperformance

If, for any reason, the contractor breaches the contract by failing to satisfactorily fulfill or perform any obligations, promises, terms, or conditions, and having been given reasonable notice of and opportunity to cure such default, fails to take satisfactory corrective action within the time specified by the Judiciary, the Judiciary may terminate the contract, in whole or in part, the termination of all outstanding contracts or sub-contracts held by the contractor, and the suspension or debarment of the contractor from future procurements by giving written notice to the contractor specifying the date for termination. The Judiciary shall endeavor to provide such notice at least seven (7) calendar days before the effective date of the termination.

A contractor who fails to commence within the time specified or complete an award made for repairs, alterations, construction, or any other service will be considered in default of contract. If contractor consistently fails to deliver quantities or otherwise perform as specified, the Judicial Purchasing Agent reserves the right to terminate the contract and contract for completion of the work with another contractor and seek recourse from the defaulting contractor or his surety. In the event of a termination for default or nonperformance, in whole or in part, the Judiciary may procure similar goods or services in a manner and upon terms it deems appropriate, and the contractor shall be liable for the excess costs incurred by the Judiciary as a result of the contractor's default. The contractor, or its surety, agrees to promptly reimburse the Judiciary for the excess costs, but shall have no claim to the difference should the replacement cost be less.

2. Termination Without Cause

The Judiciary may terminate the contract in whole or in part without cause at any time by giving written notice to the contractor of such termination at least thirty (30) days before the effective date of such termination. The notice shall specify the part(s) of the contract being terminated and the effective termination date.

Within thirty (30) days of the effective date of the termination of the contract the contractor shall compile and submit to the Judiciary an accounting of the work performed up to the date of termination. The Judiciary may consider the following claims in determining reasonable compensation owed to the contractor for work performed up to the date of termination:

- (a) contract prices for goods or services accepted under the contract;
- (b) costs incurred in preparing to perform and performing the terminated portion of the contract; or
- (c) any other reasonable costs incurred by the contractor as a result of the termination.

The total sum to be paid to the contractor shall not exceed the total contract price, less any payments previously made to the contractor, the proceeds from any sales of goods or manufacturing materials, and the contract price for work not terminated.

3. Contractor's Obligations in the Event of Termination

If the contract is terminated for any reason, or expires pursuant to its terms, the contractor shall transfer and deliver to the Judiciary in the manner and to the extent directed by the Judiciary:

- all finished or unfinished material prepared by the contractor; and
- all material, if any, provided to the contractor by the Judiciary.

For the purposes of the contract, "material" shall include, but is not limited to, goods, supplies, parts, tools, machinery, equipment, furniture, fixtures, information, data, reports, summaries, tables, maps, charts, photographs, studies, recommendations, files, audiotapes, videotapes, records, keys, security badges, and documents.

If the contract is terminated for cause, the contractor shall not be relieved of liability to the Judiciary for damages sustained because of any breach by the contractor. In such event, the Judiciary may retain any amounts which may be due and owing to the contractor until such time as the exact amount of damages due the Judiciary from the contractor has been determined by the Judicial Purchasing Agent. The Judiciary may also set off any damages so determined against the amounts retained.

Upon termination of the contract, the contractor shall stop performance on the date specified, terminate any outstanding orders and subcontracts applicable to the terminated portion of the contract, and shall incur no further commitments or obligations in connection with the terminated performance. The contractor shall settle all liabilities and claims arising out of the termination of subcontracts and order generating from the terminated performance. The Judiciary may direct the contractor to assign the contractor's right, title and interest under terminated orders or subcontracts to the Judiciary or a third party.

Terminations of Purchase Order Contracts or Master Pricing Agreements shall require the signature of the Judicial Purchasing Agent or his designee. Notice of termination by either party shall be submitted in writing to the other party in accordance with the termination clause of the contract, or where no specific termination clause is included, written notice shall be provided no later than thirty (30) days before the expiration of the contract.

#### 34. INDEMNITY

The contractor guarantees:

- a. To save the Judiciary, its agents and employees, harmless from any liability imposed upon the Judiciary arising from the negligence, either active or passive, of the contractor, as well as for the use of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of the contract of which the contractor is not the patentee, assignee or licensee.
- b. To pay for all permits, licenses and fees and give all notices and comply with all laws, ordinances, rules and regulations of the city or town in which the installation is to be made and of the State of Rhode Island.
- c. That the equipment offered is standard new equipment, latest model of regular stock product with all parts regularly used with the type of equipment offered; also, that no attachment or part has been substituted or applied contrary to manufacturer's recommendations and standard practice.

#### 35. CONTRACTOR'S OBLIGATIONS

In addition to the specific requirements of the contract, construction and building repair contractors bear the following standard responsibilities:

- a. To furnish adequate protection from damage for all work and to repair damages of any kind, for which he or his workmen are responsible, to the building or equipment, to his own work, or to the work of other contractors;
- b. The contractor, its subcontractor(s) and their employees and/or agents, shall protect and preserve property in the contractor or subcontractor's possessions in which the Judiciary has an interest, and any and all materials provided to the contractor or subcontractor by the Judiciary;
- c. To clear and remove all debris and rubbish resulting from his work from time to time, as directed or required, a completion of the work leave the premises in a neat unobstructed condition, broom clean, and in satisfactory order and repair;
- d. To store equipment, supplies, and material at the site only upon approval by the Judiciary, and at his own risk;
- e. To perform all work so as to cause the least inconvenience to the Judiciary, and with proper consideration for the rights of other contractors and workmen;
- f. To acquaint themselves with conditions to be found at the site, and to assume responsibility for the appropriate dispatching of equipment and supervision of his employees during the conduct of the work;

- g. To ensure that his employees are instructed with respect to special regulations, policies, and procedures in effect for any judicial facility or site, and that they comply with such rules, including but not limited to security policies or practices and/or criminal background checks for any employees and/or subcontractors;
- h. The contractor shall ensure that its employees or agents are experienced and fully qualified to engage in the activities and services required under the contract;
- i. The contractor shall ensure that at all times while services are being performed under this contract at least one of its employees or agents on the premises has a good command of the English language and can effectively communicate with the Judiciary and its staff;
- j. The contractor and contractor's employees or agents shall comply with all applicable licensing and operating requirements required by federal or state law and shall meet accreditation and other generally accepted standards of quality in the applicable field of activity;
- k. The contractor shall secure and retain all employee-related insurance coverage for its employees and agents as required by law; and
- l. The contractor, subcontractor, and his or her employees and agents shall not disclose any confidential information of the Judiciary to a third party. Confidential information means:
  - (1) any information of a sensitive or proprietary nature, whether or not specially identified as confidential or proprietary; or
  - (2) any information about the Judiciary gained during the performance of a contract that is not already lawfully in the public domain.

36. FORCE MAJEURE

All orders shall be filled by the contractor with reasonable promptness, but the contractor shall not be held responsible for any losses resulting if the fulfillment of the terms of the contract shall be delayed or prevented by wars, acts of public enemies, strikes, fires, floods, acts of God, or for any other acts not within the control of the contractor and which by the exercise of reasonable diligence, the contractor is unable to prevent.