City of Auburn, Maine
Finance Department
Jill Eastman, Director
www.auburnmaine.gov | 207.333.6601
60 Court Street, Auburn, Maine 04210

July 5, 2017

Dear Bidder:

The City of Auburn is accepting written proposals for the Auburn City Hall for a **Chiller Replacement Project,** located at 60 Court Street, Auburn, ME. The City reserves the right to accept or reject any or all proposals in whole or in part and to waive any informality the City may determine necessary. The City also reserves to itself the exclusive right to accept any proposals when it is deemed by the City to be in its best interest. The City of Auburn is governed by Title 1 M.R.S.A. § 401-410, otherwise known as the Freedom of Information Act, which considers bid specifications as public documents. In awarding any proposal, the City may consider, but not be limited to, any of the following factors: Bidder qualifications, price, experience, financial standing with the City, warranties, references, bonding, delivery date, and service of Bidder. Vendors/Contractors shall be current on all amounts due to the City of Auburn prior to the City entering into any contract agreement. All proposals must include FOB to Auburn, Maine unless otherwise specified.

A **mandatory** pre-bid meeting to review the work site is scheduled for Wednesday, July 12, 2017 at 9:00 a.m.at the Auburn City Hall, 60 Court Street, Auburn, ME. Please contact Derek Boulanger at dboulanger@auburnmaine.gov to confirm participation.

Proposals will not receive consideration unless submitted in accordance with the following instructions to bidders. Please mark sealed envelopes plainly:
**"City Hall Chiller Replacement Project – Bid No. 2018-001."**

Questions regarding this Request for Proposals should be directed to Derek Boulanger, Facilities Manager/Purchasing Agent, at (207) 333-6601, ext. 1135.

Please submit your proposal to the City of Auburn by **2:00 p.m. Thursday, July 27, 2017.** Proposals will be opened at 2:00 p.m. Proposals must be delivered to **Derek Boulanger, Facilities Manager/Purchasing Agent, 60 Court Street, Auburn, ME 04210** on or before the date and time appointed. No proposals will be accepted after the time and date listed above.

Sincerely,

Derek Boulanger
Facilities Manager/Purchasing Agent

## Table of Contents

## CONDITIONS AND INSTRUCTIONS TO BIDDERS

1. Bidders shall use the enclosed bid form for quotations. Whenever, in bid forms, an article is defined by using a trade name or catalog number, the term "or approved equal", if not inserted, shall be implied.

2. Submit a separate unit price for each item unless otherwise specified in the bid request. Award will be made on a basis of each item, or as a group, whichever is in the best interest of the City. Prices stated are to be "delivered to destination".

3. Bid proposals must be completed in full, in ink, and must be signed by firm official. Bid proposal **must be notarized** prior to bid being sealed and will be disqualified if not notarized. Bids may be withdrawn prior to the time set for the official opening.

4. Bids will be opened publicly. Bidders or representatives may be present at bid opening.

5. Awards will be made to the lowest responsible bidder, considering the quality of the materials, date of delivery, cost which meets specification and is in the best interest to the City of Auburn.

6. All transportation charges, including expense for freight, transfer express, mail, etc. shall be prepaid and be at the expense of the vendor unless otherwise specified in the bid.

7. The terms and cash discounts shall be specified. Time, in connection with discount offered, will be computed from date of delivery at destination after final inspection and acceptance or from date of correct invoice, whichever is later.

8. The City is exempt from payment of Federal Excise Taxes on the articles not for resale, Federal Transportation Tax on all shipments and Maine Sales Tax and Use Taxes. Please quote less these taxes. Upon application, exemption certificate will be furnished with the Purchase Order when required.

9. Time of delivery shall be stated. If time is of the essence, the earliest date may be a factor in the bid award.

10. No contract may be assigned without the written consent of the Finance Director or her designate. The contract shall not be considered valid until a purchase order has been issued to the successful bidder.

11. Please state **"City Hall Chiller Replacement Project – Bid No. 2018-001"** on submitted sealed envelope.

12. The City of Auburn reserves the right to waive any formality and technicality in bids whichever is deemed best for the interest of the City of Auburn.

13. All work shall be substantially completed by October 31, 2017. Final completion shall be on or before November 30, 2017.

## GENERAL CONDITIONS

### 1. Equal Employment Opportunity

The City of Auburn is an Equal Opportunity Employer and shall not discriminate against an applicant for employment, and employee or a citizen because of race, color, sex, marital status, physical and/or mental handicap, religion, age, ancestry or natural origin, unless based upon a bona-fide occupation qualification. Vendors and contractor or their agents doing business with the City shall not violate the above clause or the Civil Rights Acts of 1964. Violations by vendors shall be reviewed on a case-by-case basis and may mean an automatic breach of contract or service to the City of Auburn.

### 2. Save Harmless

The Bidder agrees to protect and save harmless the owner from all costs, expenses or damages that may arise out of alleged infringement of patents of materials used.

### 3. Subcontracting

The Bidder shall not subcontract any part of the work or materials or assign any monies due it without first obtaining the written consent of the municipality. Neither party shall assign or transfer its interest in the contract without the written consent of the other party.

### 4. Warranty

The Bidder warrants that all work will be of good quality and free from faults and defects, and in conformance with the specifications. All work not so conforming to these standards may be considered defective. The Bidder agrees to be responsible for the acts and omissions of all of its employees and all subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Bidder.

### 5. Bonds, Retainage and Payments

5.1 A bid bond shall be submitted with appropriate bid forms in the amount of 5% of the total contract value.

5.2 Payment and performance bonds will be required from the contractor who is awarded this contract.

5.3 Retainage in the amount of 10% will be held from each progress payment and shall be released at the discretion of the Project Engineer. Payments shall be made by the City to the Contractor 30 days after receipt of the request for payment.

### 6. Changes in the Work

6.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.

6.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on

the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.

6.3 The Architect shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.

6.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Architect. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.

6.5 The method of determining the dollar value of extra work shall be by:
a) an estimate of the Contractor accepted by Owner as a lump sum, or
b) unit prices named in the contract or subsequently agreed upon, or
c) cost plus a designated percentage, or
d) cost plus a fixed fee.

6.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods using the following rates. The rates include all overhead and profit expenses.
a) Contractor - for any work performed by the Contractor's own forces, 10% of the cost;
b) Subcontractor - for work performed by Subcontractor's own forces, 10% of the cost;
c) Contractor - for work performed by Contractor's Subcontractor, 10% of the amount due the Subcontractor.

6.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Architect shall review and certify the appropriate amount which includes the Contractor's overhead and profit. The Owner shall make payments based on the Architect's certificate.

## 7. Liens

7.1 The Contractor shall deliver to the Owner a complete release of all liens arising out of this contract before the final payment or any part of the retainage payment is released. The Contractor shall provide with the release of liens an affidavit asserting each release includes all labor and materials for which a lien could be filed. Alternately, the Contractor, in the event any Subcontractor or supplier refuses to furnish a release of lien in full, may furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien.

7.2 In the event any lien remains unsatisfied after all payments to the Contractor are made by the Owner, the Contractor shall refund to the Owner all money that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney's fees.

**BID PROPOSAL FORM**
**City Hall Chiller Replacement Project – Bid No. 2018-001**
**Due: Thursday, July 27, 2017 at 2:00 PM**

To: City of Auburn
Derek Boulanger, Facilities Manager/Purchasing Agent
60 Court Street
Auburn, ME 04210

The undersigned individual/firm/business guarantees this price for Thirty days (30) from the bid due date. The undersigned submits this proposal without collusion with any other person, individual, firm, or agency. The undersigned ensures the authority to act on behalf of the corporation, partnership, or individual they represent; and has read and agreed to all of the terms, requests, or conditions written herein by the City of Auburn. By signing this bid form, the firm listed below hereby affirms that its bid meets the minimum specifications and standards as listed above and as amended in Addendums #_____ Dated_____.

Signature _____ Name (print)_____

Title_____ Company_____

Address_____

Telephone No._____ Fax No. _____

Email Address:_____

STATE OF MAINE
_____, SS. Date: _____

Personally appeared _____ and acknowledged the foregoing instrument to be his/her free act and deed in his/her capacity and the free act and deed of said company.

_____
Notary Public

_____
Print Name

_____
Commission Expires

**SCHEDULE OF VALUES - Owner Option A: Chiller to be Screw Compressor Type**

PROJECT NAME: **City Hall Chiller Replacement Project – Bid No. 2018-001**

**BID BREAKDOWN OWNER OPTION A – SCREW COMPRESSOR TYPE:**

| Item | Description | Value |
|---|---|---|
| 1. | General Conditions | $_____ . _____ |
| 2. | General Requirements | $_____ . _____ |
| 3. | Demolition & Disposal | $_____ . _____ |
| 4. | Crane & Rigging | $_____ . _____ |
| 5. | Safety Control (barricades, etc.) | $_____ . _____ |
| 6. | Owner Option A: Screw Chiller Equipment | $_____ . _____ |
| 7. | Owner Option C: Chilled Water Pump | $_____ . _____ |
| 8. | Mechanical Equipment, Piping & Accessories | $_____ . _____ |
| 9. | Piping Insulation | $_____ . _____ |
| 10. | Electrical | $_____ . _____ |
| 11. | Automatic Temperature Controls | $_____ . _____ |
| 12. | Steel Modifications (if necessary) | $_____ . _____ |
| 13. | Testing, Adjusting & Balancing | $_____ . _____ |
| 14. | Other (specify) _____ | $_____ . _____ |
| 15. | Other (specify) _____ | $_____ . _____ |
| **16.** | **TOTAL BASE BID (Sum of Items 1 through 15)** | **$_____ . _____** |

**ADD ALTERNATES**

| | | |
|---|---|---|
| **D.** | Additive costs above the base bid to substantially complete chiller shut-down to chiller start-up from Noon on Friday to the following Monday by 7:00am. | $_____ . _____ |
| **E.** | Additive costs above the base bid to provide an extended five (5) year full unit warranty on the chiller including compressor(s). | $_____ . _____ |
| **F.** | Additive costs above the base bid to provide an extended ten (10) year full unit warranty on the chiller including compressor(s). | $_____ . _____ |

**TOTAL OF ALL LINE ITEMS IN SCHEDULE OF VALUES MUST EQUAL FINAL BASE BID. THERE MUST BE AMOUNTS IN EACH OF THE SPECIFIED ITEMS ABOVE. A ZERO SHALL BE ENTERED IF THE LINE ITEM IS NOT APPLICABLE.**

**FAILURE TO PROPERLY COMPLETE THIS ATTACHEMENT MAY BE CONSIDERED A NON-RESPONISVE PROPOSAL AND MAY BE REJECTED AT THE OWNERS DISCRETION.**

**SCHEDULE OF VALUES - Owner Option B: Chiller to be Scroll Chiller Compressor Type**

PROJECT NAME: **City Hall Chiller Replacement Project – Bid No. 2018-001**

**BID BREAKDOWN OWNER OPTION B - SCROLL COMPRESSOR TYPE:**

| Item | Description | Value |
|---|---|---|
| 1. | General Conditions | $_____ . _____ |
| 2. | General Requirements | $_____ . _____ |
| 3. | Demolition & Disposal | $_____ . _____ |
| 4. | Crane & Rigging | $_____ . _____ |
| 5. | Safety Control (barricades, etc.) | $_____ . _____ |
| 6. | Owner Option B: Scroll Chiller Equipment | $_____ . _____ |
| 7. | Owner Option C: Chilled Water Pump | $_____ . _____ |
| 8. | Mechanical Equipment, Piping & Accessories | $_____ . _____ |
| 9. | Piping Insulation | $_____ . _____ |
| 10. | Electrical | $_____ . _____ |
| 11. | Automatic Temperature Controls | $_____ . _____ |
| 12. | Steel Modifications (if necessary) | $_____ . _____ |
| 13. | Testing, Adjusting & Balancing | $_____ . _____ |
| 14. | Other (specify) _____ | $_____ . _____ |
| 15. | Other (specify) _____ | $_____ . _____ |
| **16.** | **TOTAL BASE BID (Sum of Items 1 through 15)** | **$_____ . _____** |

**ADD ALTERNATES**

| | | |
|---|---|---|
| **D.** | Additive costs above the base bid to substantially complete chiller shut-down to chiller start-up from Noon on Friday to the following Monday by 7:00am. | $_____ . _____ |
| **E.** | Additive costs above the base bid to provide an extended five (5) year full unit warranty on the chiller including compressor(s). | $_____ . _____ |
| **F.** | Additive costs above the base bid to provide an extended ten (10) year full unit warranty on the chiller including compressor(s). | $_____ . _____ |

**TOTAL OF ALL LINE ITEMS IN SCHEDULE OF VALUES MUST EQUAL FINAL BASE BID. THERE MUST BE AMOUNTS IN EACH OF THE SPECIFIED ITEMS ABOVE. A ZERO SHALL BE ENTERED IF THE LINE ITEM IS NOT APPLICABLE.**

**FAILURE TO PROPERLY COMPLETE THIS ATTACHEMENT MAY BE CONSIDERED A NON-RESPONISVE PROPOSAL AND MAY BE REJECTED AT THE OWNERS DISCRETION.**

**BID BOND**

KNOW ALL BY THESE PRESENTS, that we, the undersigned, _____as Principal, and _____ as Surety, are hereby held and firmly bound unto _____as OWNER in the penal sum of _____for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____day of _____, 2016.

The Condition of the above obligation is such that whereas the principal has submitted to _____a certain BID,

attached hereto and hereby made a part hereof to enter into a contract in writing, for the _____

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for all and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S)
Principal

Surety

By:_____

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

## CONTRACTOR PERFORMANCE BOND

Bond No.: ***insert bond number***

We, the undersigned, ***insert company name of Contractor***, ***select type of entity*** of ***insert name of municipality*** in the State of ***insert name of state*** as principal, and ***insert name of surety*** as Surety, are hereby held and firmly bound unto ***select title of obligee*** in the penal sum of the Contract Price $ ***insert the Contract Price in numbers*** for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract, for the construction of ***insert name of project as designated in the contract documents***, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

## CONTRACTOR PERFORMANCE BOND

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract.

**Contractor**

_____

*(Signature)*

***insert name and title***

***insert company name***

***insert address***

***insert city state zip code***

**Surety**

_____

*(Signature)*

***insert name and title***

***insert company name***

***insert address***

***insert city state zip code***

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

## CONTRACTOR PAYMENT BOND

Bond No.: ***insert bond number***

We, the undersigned, ***insert company name of Contractor***, ***select type of entity*** of ***insert name of municipality*** in the State of ***insert name of state*** as principal, and ***insert name of surety*** as Surety, are hereby held and firmly bound unto ***select title of obligee*** in the penal sum of the Contract Price $ ***insert the Contract Price in numbers*** for the use and benefit of claimants, defined as an entity having a contract with the principal or with a subcontractor of the principal for labor, materials, or both labor and materials, used or reasonably required for use in the performance of the contract, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract, for the construction of ***insert name of project as designated in the contract documents***, and shall fully reimburse the oblige for all outlay and expense with said oblige may incur in making good any default of said principal, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

## CONTRACTOR PAYMENT BOND

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract.

**Contractor**

---

*(Signature)*

***insert name and title***

***insert company name***

***insert address***

***insert city state zip code***

**Surety**

---

*(Signature)*

***insert name and title***

***insert company name***

***insert address***

***insert city state zip code***

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

## SAMPLE CONTRACT AGREEMENT

THIS AGREEMENT is made this ### day of ***Month Year***, by and between the CITY OF AUBURN, a municipal corporation existing under the laws of the State of Maine and located in the County of Androscoggin, State of Maine (hereinafter "CITY"), ***Company Name, Address, EIN***, (hereinafter "CONTRACTOR"),

WITNESSETH:
In consideration of the mutual covenants and conditions contained herein, the CITY and the CONTRACTOR agree as follows:

**SPECIFICATIONS:**

1. The CONTRACTOR shall furnish all of the material and perform all of the work shown on the drawings and described in the specifications entitled: **Bid # *XXXXX Bid Title***
which are attached hereto and made a part hereof, and the CONTRACTOR covenants that it shall do everything required by this Agreement, the Special Provisions of the Agreement, the Invitation to Bid and the Specifications in return for payment as provided herein.

**COMPLETION DATE:**

2. The work to be performed under this Agreement shall be commenced by ***Month Day, 2017*** and fully completed on or before ***November 30, 2017***.

**CONTRACT PRICE:**

3. The CITY shall pay the CONTRACTOR for the performance of the Agreement the sum of **$*XXX***

**PERFORMANCE BOND:**

4. If required by the City, the CONTRACTOR shall furnish to the CITY at the time of the execution of this Agreement a performance bond and a labor and material payment bond each in the amount of **$*XXX*** (whichever applies) executed by a surety company satisfactory to the CITY, guaranteeing the performance and payment by the CONTRACTOR. ❑ Yes, Required (Initials: ____) ❑ No, Waived (Initials ___)

**GUARANTEE:**

5. The CONTRACTOR shall guarantee his work against any defects in workmanship and materials for a period of one year from the date of the CITY's written acceptance of the project.

**PERMITS AND LICENSES:**

6. Permits and licenses necessary for the prosecution of the work shall be secured and paid by the CONTRACTOR.

**CITY'S RIGHT TO TERMINATE CONTRACT:**

7. If the CONTRACTOR should be adjudged a bankrupt, or if it should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if it should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, and ordinances, or otherwise be guilty of a substantial violation of any provision of the Agreement, then the CITY when sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the CONTRACTOR, and his surety, seven (7) days written notice, terminate the employment of the CONTRACTOR and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method it may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Agreement price shall exceed the expense of the finishing the work, including compensation for additional architectural, managerial and administrative services, such excess shall be paid to the CONTRACTOR. If such expense shall exceed such unpaid balance, the CONTRACTOR shall pay the difference to the CITY.

**CONTRACTOR'S LIABILITY INSURANCE:**

8. The CONTRACTOR shall not commence work under this Agreement until he has obtained all insurance required under this paragraph and such insurance has been approved by the CITY, nor shall the CONTRACTOR allow any subcontractor to commence work on his subcontract until all similar insurance required of subcontractor has been so obtained and approved. **It is a requirement that the CITY be named as an Additional Insured on the General Liability and Automobile Liability policies.**

(a) **Commercial General Liability** to include products and completed operations, and blanket contractual. The limits of liability shall be as follows:

| | |
|---|---|
| Bodily Injury and Property Damage | $1,000,000 |
| Personal Injury and Advertising Injury | $1,000,000 |
| Per Project Aggregate | $1,000,000 |
| General Aggregate | $2,000,000 |
| Products and Completed Operations Aggregate | $2,000,000 |
| Medical Payments | $10,000 |

(b) **Business Automobile Liability**

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractors to maintain business automobile liability insurance covering all owned, non-owned, leased, rented or hired automobiles (symbol 1). The limits of liability shall be as follows:

| | |
|---|---|
| Bodily Injury and Property Damage | $1,000,000 |

Automobile physical damage coverage shall be at the option of the CONTRACTOR, all sub-contractors and lower tier contractors. The CITY shall not be liable for physical loss or damage to any owned, non-owned, leased, rented or hired automobile.

(c) **Workers' Compensation Insurance**

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractor's to maintain Workers' Compensation and Employers Liability in accordance with the laws and regulations of the State of Maine. The limits of liability provided shall be as follows:

| | |
|---|---|
| Coverage A: | Statutory |
| Coverage B: | $100,000/$500,000/$100,000 |

(d) **Professional Liability**

If the CONTRACTOR is an Architect, Engineer or Surveyor, they shall maintain a policy of insurance to pay on their behalf whatever amounts that may become legally required to pay on account of an error, omission or negligent act.

Limits of Liability shall be as follows:

$1,000,000 per occurrence and in the aggregate site specific.

It is a requirement that this policy be maintained for a period of three (3) years following completion of the project.

(e) **Certificates of Insurance** of the types and in the amounts required shall be delivered to the CITY prior to the commencement of any work by the CONTRACTOR, subcontractor or lower tier contractor or any person or entity working at the direction or under control of the CONTRACTOR. The CONTRACTOR shall assume the obligation and responsibility to confirm insurance coverage for all sub-contractors or lower tier contractors who will participate in the project.

(f) The Certificate of Insurance and the policies of insurance shall include a sixty (60) day notice to the CITY of cancellation, non-renewal or material change in coverage or form.

(g) The CONTRACTOR and his surety shall indemnify and save harmless the CITY, his officers and employees from all suits, actions or claims of any character brought because of any injuries or damage received or sustained by any person, persons or property on account of the operations of the said CONTRACTOR; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said CONTRACTOR; or because of any claims or amounts recovered from any infringements or patent trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act" or of any other law, ordinance, order or decree; and so much of the money due to the said CONTRACTOR under and by virtue of his/her contract as shall be considered necessary by the CITY for such purpose, may be retained; or in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the CITY.

(h) **Waiver of Subrogation**

Payment of any claim or suit including any expenses incurred in connection therewith by the CITY, or any insurance company on behalf of the CITY shall not constitute a waiver of subrogation against the CONTRACTOR, sub-contractors or any lower tier contractor in the event that such claim or suit was caused by or contributed to as a result of the negligent acts of the CONTRACTOR, any sub-contractors or lower tier contractors.

(i) **Construction Agreement**

The CONTRACTOR shall and does hereby agree to indemnify, save harmless and defend the CITY from the payment of any sum or sums of money to any person whomsoever on account of claims or suits growing out of injuries to persons, including death, or damages to property, caused by the CONTRACTOR, his employees, agents or sub-contractors or in any way attributable to the performance and execution of the work herein contracted for, including (but without limiting the generality of the foregoing), all claims for service, labor performed, materials furnished, provisions and suppliers, injuries to persons or damage to property, liens, garnishments, attachments, claims, suits, costs, attorney's fees, costs of investigation and defense. It is the intention of this paragraph to hold the CONTRACTOR responsible for the payment of any and all claims, suits, or liens, of any nature character in any way attributable to or asserted against the CITY, or the CITY and the CONTRACTOR, which the City may be required to pay. In the event the liability of the CONTRACTOR shall arise by reason of the sole negligence of the CITY and/or the sole negligence of the CITY's agents, servants or employees, then and only then, the CONTRACTOR shall not be liable under the provisions of this paragraph.

**DAMAGES:**

9. The CONTRACTOR shall defend, indemnify and save harmless the CITY and all persons acting for or in behalf of it against all claims for injuries (including death), loss or damage, arising out of the performance out this contract.

**LIENS:**

10. Neither the final payment nor any part of the retained percentage shall become due until the CONTRACTOR, if required, shall deliver to the CITY a complete release of all liens arising out of the Agreement, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the CONTRACTOR may, if any SUB-CONTRACTOR refuses to furnish a release or receipt in full, furnish a bond satisfactory to the CITY to indemnify it against any lien. If any lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the CITY all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

**ASSIGNMENT:**

11. Neither party to the Agreement shall assign the Agreement or sublet it as a whole without the written consent of the other, nor shall the CONTRACTOR assign any moneys due or to become due to it hereunder, without the previous written consent of the CITY.

**SUBCONTRACTS:**

12. The CONTRACTOR shall not sublet any part of this Agreement without the written permission of the CITY. The CONTRACTOR agrees that it is as fully responsible to the CITY for the acts and omissions of its SUB-CONTRACTORS and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

**USE OF PREMISES:**

13. The CONTRACTOR shall confine its apparatus, the storage of materials and operations of its workers to limits indicated by law, ordinance and permits and shall not otherwise unreasonably encumber the premises with its materials. If any part of the project is completed and ready for use, the CITY may, by written and mutual consent, without prejudice to any of its rights or the rights of the CONTRACTOR, enter in and make use of such completed parts of the project. Such use or occupancy shall in no case be construed as an acceptance of any work or materials.

**CLEANING UP:**

14. The CONTRACTOR shall at all times keep the premises free from accumulation of waste materials or rubbish caused by its employees or work, and at the completion of the work it shall remove all its rubbish from and about the project, and all its tools, scaffolding and surplus materials and shall leave its work "broom-clean" or its equivalent, unless more exactly specified. In case of dispute, the CITY may remove the rubbish and charge the cost to the CONTRACTOR.

**PAYMENTS:**

15. Unless otherwise agreed to, the CITY shall make payments on account of the Agreement as follows:

Within 30 days, as invoices are submitted for work completed to the satisfaction of the CITY.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first above written.

BY:_____ BY:_____
Witness Finance Director

BY:_____ BY:_____
Witness Contractor

# CITY OF AUBURN, MAINE

## CITY HALL
## CHILLER REPLACEMENT PROJECT

60 Court Street, Auburn, Maine

Bid No. 2018-001

Bid Documents

July 5, 2017

## APPENDIX A
## CONSTRUCTION SPECIFICATIONS

# CITY OF AUBURN, MAINE

# CITY HALL
# CHILLER REPLACEMENT PROJECT

**60 Court Street, Auburn, Maine**

**Bid No. 20187-001**


**100% Bid Specifications**

**July 5, 2017**

# SECTION 00 01 00

# TABLE OF CONTENTS



**END OF SECTION 00 01 00**

# SECTION 00 01 02
# PROJECT INFORMATION

## PART 1 GENERAL

### 1.01 PROJECT IDENTIFICATION

A. Project Name: City Hall Chiller Replacement, located at 60 Court Street, Auburn, Maine 04210.

B. The Owner, hereinafter referred to as Owner: The City of Auburn, Maine.

C. A&E Consultant & Owner's Representative: Cordjia Capital Projects Group
   1. Contact: Mitch Daigle
   2. Address: 16 Tannery Lane, Suite 23; PO Box 1367
   3. City, State, Zip: Camden, Maine 04843
   4. Phone / Fax: (207) 236-9970 / (207) 236-9971
   5. E-mail: mdaigle@cordjiacpg.com

### 1.02 PROJECT DESCRIPTION

A. The project consists of but is not limited to the removal and replacement of the existing rooftop mounted chiller including mechanical, electrical, building automation controls, support steel modifications (if necessary), lifting and rigging and testing & balancing for the City Hall building. The building included in this specification is owned and operated by The City of Auburn, Maine located at City Hall, 60 Court Street in Auburn, Maine.

B. Contract Terms: City of Auburn, Maine Standard Form of Agreement Between Owner and Contractor.

C. A Bid Bond is required.

D. The selected contractor will be required to furnish 100% Performance and Payment Bonds unless the Owner requests to waive such bonds after award.

C. Scheduling of the Work: The selected Contractor will be required to participate with the Owner and the Owners Representative to schedule the scope of work based on the Owners requirements.

D. The premises at the project site are open for examination by bidders during the bid period with advance notice and approval from the Owner during the following hours:
   1. Monday through Friday: 8:00 a.m. to 3:00 p.m.

### 1.03 PROJECT CONSULTANTS

A. Mechanical Consultant: Mechanical Systems Engineers
   1. Address: 10 Forest Falls Drive, Unit #10B
   2. City, State, Zip: Yarmouth, Maine 04096
   3. Phone / Fax: (207) 846-1441 / (207) 846-1443
   4. E-mail: kurt@mechanicalsystemseng.com

## 1.04 PROCUREMENT TIMETABLE

A. Mandatory Pre-Bid Meeting: 9:00 AM on July 12, 2017 at the City Hall Building, located at 60 Court Street, Auburn, Maine.

B. Last Request for Information Due: July 20, 2017 prior to 2:00 PM.

C. Final Addenda Issued By: July 24, 2017 prior to 2:00 PM.

C. Bid Due Date: July 27, 2017, on or before 2:00 PM local time.

D. Contract Negotiations: Within 15 calendar days after due date.

E. Notice of Award: Within 30 calendar days after due date.

F. Proposals May Not Be Withdrawn Until: 30 calendar days after bid due date.

G. Substantial Completion Date: October 31, 2017.

H. Final Completion Date: November 30, 2017.

I. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

## 1.05 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:
   1. From the Owner's Representative for a non-refundable fee of:
      a. $50 for one complete printed set of specifications and full scale drawings.
      b. Electronic PDF file emailed at no charge.
      c. Download from the Bid Notices section of the City of Auburn website.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION (NOT USED)

**END OF SECTION 00 01 02**

# SECTION 01 00 00

# ADMINISTRATIVE PROVISIONS

## PART 1 GENERAL

## 1.01 CONTRACT REQUIREMENTS

A. Scope of Work

1. The Work of the Contract includes but is not limited to the removal and replacement of the existing rooftop mounted chiller including mechanical, electrical, building automation controls, support steel modifications (if necessary), lifting and rigging, and testing & balancing for the Auburn, Maine City Hall building in accordance with the Contract Documents.

B. Contract Method

1. Basis of award of this Contract will be in accordance with the Conditions and Instructions to Bidders section within the RFP.

2. Contract type: City of Auburn, Maine Standard Form of Agreement Between Owner and Contractor. A Sample Agreement is located within Division 00 of the RFP.

3. The project will be constructed under a single lump sum contract.

C. Work Sequence

1. Work of the Contract and related provisions are as described in the Contract Documents.

D. Contractor Use of Premises

1. Work of this Contract includes coordinating the work with the daily operations of the Owner. The Contractor will be responsible to coordinate with the Owners other Contractors (if any) for Work completed during the Work of this Contract.

2. Limit use of premises for Work and construction operations only, allow for Owner occupancy, work by Owners other Contractors, and public access.

4. Limit access to Owner's site, hours of operations are 7:00 A.M. - 6:00 P.M. If Contractor would like to work off-hours, on weekends or federal and state holiday’s he/she must request permission from Owner three working days in advance. The Owner reserves the right to accept or reject the Contractor’s request.

6. Coordinate use of premises under direction of Owner.

7. The Contractor shall be responsible for his/her safety and security in Construction Area until substantial completion. The Contractor shall coordinate safety and security with the Owner.

E. Owner Occupancy:

1. Owner will occupy the facility during entire period of construction, to conduct Owner's normal operations. The Contractor shall cooperate with Owner to minimize conflict to the Owner's operations.

F. Schedule of Allowances: Not Used

G. Base Bid:

1. Reference Section 23 00 00, MECHANICAL, Part 1.02 for Bidding Options.

2. Substantially complete chiller shut-down to chiller start-up during regular working hours which are M-F 7:00am to 6:00pm with the maximum downtime for chiller operation to be 72 hours with Owner pre-approval of dates.

H. Additive Alternates:

3. Add Alternate D – Additive costs above the base bid to substantially complete chiller shut-down to chiller start-up from Noon on Friday to the following Monday by 7:00am.

4. Add Alternate E - Additive costs above the base bid to provide an extended 5-year full unit warranty on the chiller including compressor(s).

5. Add Alternate F - Additive costs above the base bid to provide an extended 10-year full unit warranty on the chiller including compressor(s).

I. Unit Prices: Not Used

J. Applications for Payment:

1. Submit Two (2) copies of each application using a form that is acceptable to the Owner and the Architect/Engineer, hereafter referred to solely as Owner. Provide Lien Waivers with each application for payment.

K. Coordination:

1. Work of this Contract includes coordination of the entire Work of the Project. The Contractor will also be responsible to coordinate with the Owners other Contractors (if any) for Work completed during the Work of this Contract.

2. The Contractor shall obtain and pay for all necessary construction/building permits. The Contractor shall send two (2) copies of all permits to the Owner and post at the project site in accordance with the issuing authority. Permit fees payable to the City of Auburn, Maine will be waived.

3. Coordinate work with all utilities. Interruption of services shall be coordinated with an appropriate official at the facility to minimize the disruption of operations within the facility.

4. Notify an appropriate official at the facility at least three days in advance of the need to move furnishings, equipment, materials, etc. from areas to be affected by the Work.

5. Control on-site activities to minimize the disruption of the occupants.

6. Coordinate the work of equipment and material suppliers and subcontractors.

7. Make arrangements for the timely delivery of materials and supplies to the job site and for their temporary storage on site. Coordinate storage locations with the Owner.

8. Maintain the project site in a neat and safe condition.

9. Assist the Owner during periodic site visits and in the review of construction.

10. Maintain up to date progress records and as-built drawings.

L. Conflicts

1. Contractor shall notify Architect/Engineer in writing of any real or apparent conflicts in the Contract Documents and, except in cases of emergency, await Architect/Engineer's determination before proceeding.

2. The Owner’s Architect/Engineer shall resolve conflicts that arise during construction.

3. If two or more solutions are indicated in the Contract Documents, the Contractor shall assume the cost of the more expensive solution unless otherwise directed by the Owner.

M. Field Engineering

1. The Contractor shall be responsible for all field engineering as required.

2. The Contractor shall be responsible for structural steel support modifications (if necessary). Any required modifications shall be performed under the direction of a Structural Engineer licensed in the State of Maine at no additional cost to the Owner.

N. Reference Standards

1. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

2. The date of the standard is that in effect as of the Bid date, or date of Owner -Contractor Agreement when there are no bids, except when a specific date is given.

3. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

## 1.02 SCHEDULING AND PHASING OF WORK

A. Substantial Completion: Work of the Contract must be Substantially Completed by ***October 31, 2017*** so that the Owner can have full use of the facility. Final completion of all Work of this Contract shall be by ***November 30, 2017***.

1. Except as otherwise specified, Substantial Completion is hereby defined to mean a stage of completion sufficient for the Owner to have full beneficial use and occupancy of the equipment involved, less only minor corrections and repairs that can be performed without undue annoyance to building occupants which shall be documented on the "punch list" as specified hereinafter. Beneficial use and occupancy means removal of all debris, interior and exterior scaffolding, surplus equipment and material and cleaning as required under the Contract completed.

2. Normal building operations will continue throughout the length of the Project. The successful Contractor shall develop a schedule of work that is respectful of the Owner's needs but with a mutual understanding that temporary relocation of personnel within or around the facility may be required.

3. Within ten (10) working days following receipt of the fully executed formal Contract Agreement by the Contractor, the Contractor shall prepare a proposed Phasing and Progress Schedule. The final Schedule shall be as mutually agreed to by the Owner and Contractor, and within the following guidelines:

   a. The Owner's business operations must continue throughout the entire construction period.

   b. Work within the building interior must comply with the Owner's requirements for continued use and occupancy.

c. Applicable egress codes must be complied with during the construction period. In particular, fire access routes, building entrances and exit ways must be kept open at all times.

## 1.03 REGULATORY REQUIREMENTS

A. Conform to Local, State and Federal codes.

## 1.04 PROJECT MEETINGS

A. Requirements:

1. Contractor shall, upon acceptance of a Contract and before commencing Work, contact the Owner and request a pre-construction conference.

B. Pre-construction Conference:

1. The Owner will administer a pre-construction conference for execution of Owner-Contractor Agreement and exchange of information and preliminary submittals.

C. Construction Progress Meetings:

1. The Contractor shall schedule and administer Project meetings throughout progress of the Work, called meetings, and pre-installation conferences.

2. The Contractor shall make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to Owner, participants, and those affected by decisions made at meetings.

3. Attendance: Job superintendent, major Subcontractors and suppliers, Owner and those appropriate to agenda topics for each meeting.

4. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

## 1.05 SUBMITTALS

A. Procedures:

1. In all submittals always refer to the project name and bid number.

2. Submit the number of copies which Contractor requires, plus two copies, which will be retained by Owner.

3. Submittals can be delivered electronically to both the Architect/Engineer and Owner. If submitting by e-mail, submit to the Architect/Engineer for approval, and the Owner for review, at the e-mail address below:

   Architect/Engineer: mdaigle@cordjiacpg.com

   Owner: dboulanger@auburnmaine.gov

4. Submittals can be delivered in paper form. Deliver copies of submittals to Architect/Engineer for approval at the address below:

   Mitch Daigle
   16 Tannery Lane, Suite 23
   PO Box 1367
   Camden, ME 04843

   And one (1) copy to the Owner for review:

   Derek Boulanger
   Facilities Manager / Purchasing Agent
   City of Auburn
   60 Court St.
   Auburn, Me 04210

5. Submittal Sheets:
   a. Transmit each item, as specified, using a form that is acceptable to the Owner;
   b. Identify Project, Bid No., Contractor, Subcontractor, major supplier;
   c. Identify drawing sheet and detail number, and Specification Section number, as appropriate;
   d. Identify deviations from Contract Documents.

6. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

7. Architect/Engineer shall have 14 calendar days for review of submittals.

8. After the Architect/Engineer's review of submittal, revise and resubmit as required identifying changes made since previous submittal.

9. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

B. Construction Progress Schedule:

1. Submit an Initial Construction Progress Schedule in duplicate, see 1.02.A.3 this section for submission information. After review by Owner revise and resubmit as required.
2. The Contractor shall submit a Final Construction Progress Schedule within 4 calendar days of Owner review.
3. Show submittal dates required for Shop Drawings, Product Data, and Samples, and product delivery dates, including those furnished by Owner and those under Allowances as applicable.
4. Submit revised construction schedules with each Application for Payment, reflecting changes since previous submittal.

C. Schedule Of Values:

1. Submit Contract Schedule Of Values within 10 days after date of Owner - Contractor Agreement.
2. Submit Contract Schedule Of Values on a form that is acceptable to the Owner, such as the AIA G703 form.
3 Format: Table of Contents of this Project Manual.
4. Include in each line item a directly proportional amount of Contractor's overhead and profit.
5. Revise schedule of values to list change orders, for each application for payment.

D. Shop Drawings:

1. Shop drawings will be submitted to Owner, in accordance with para. 1.05 of this Section.

E. Product Data:

1. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work.

2. Submit the number of copies required in 1.05.A.2, this Section.

F. Manufacturer’s Instructions:

1. Submit the number of copies required in 1.05.A.2, this Section, of Manufacturer's Instructions.

G. Informational Submittals:

1. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
    a. Name, address, and telephone number of entity performing subcontract or supplying products.
    b. Number and title of related Specification Section(s) covered by subcontract.
    c. Drawing number and detail references, as appropriate, covered by subcontract.
2. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
    a. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

## 1.06 QUALITY CONTROL

A. Quality Control, General

1. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Workmanship

1. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

2. Perform work by persons qualified to produce workmanship of specified quality.

3. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking and as otherwise indicated by the manufacturer.

C. Manufacturers' Instructions

1. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Owner before proceeding.

D. Manufacturers' Certificates

1. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, those products that meet or exceed specified requirements.

## 1.07 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Electricity

1. The Contractor shall be allowed to hook to existing electrical panel in building, for temporary power. The Contractor will not disrupt power at building. The Owner will only pay for cost of electricity and reserves the right to deny should the use become excessive.

2. The Contractor shall provide all necessary temporary electrical panels.

3. The Contractor shall be responsible to fix any damages, caused by modifications for temporary services.

B. Lighting

1. The Contractor shall provide source of temporary lighting.

C. Heat, Ventilation

1. The Contractor shall provide source of heating as required that is beyond the heating and ventilation supplied by the Owner under normal operating conditions. The Contractor shall not use electrical heating units, if the Owner is supplying electrical power to the Contractor.

D. Water

1. The Contractor shall be allowed to hook to existing water in building, for temporary water supply. The Contractor will pay for cost of water usage for dust control and compaction [large amounts of water].

E. Sanitary Facilities

1. The Contractor shall be allowed to use the Sanitary Facilities within the building as directed by the Owner. The Owner reserves the right to revoke such use should misuse occur which is at the sole discretion of the Owner.

F. Barriers

1. The Contractor shall provide barriers as required to prevent public entry to construction areas, to provide for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.

G. The Contractor will provide as necessary:

1. Office Trailer: Weather tight, with lighting, electrical receptacles, heating, cooling and drawing display table. The office trailer will have separate office space for the project manager to conduct his/her daily business.

2. Storage Sheds for Tools, Materials, and Equipment: Weather tight, with adequate space for organized storage and access, and lighting for inspection of stored materials.
3. His/her own on-site telephone, if so required for the conduct of his/her business.

4. Protected storage, if necessary.

5. Temporary barricades to separate the Construction Site areas from the Owner's area or public area.

H. Protection and Restoration

1. The Contractor shall be responsible for all damages to furnishings, equipment, supplies, existing construction, including finished surfaces, caused by Work of Contract.

2. The Contractor shall be fully responsible for maintaining weather-tight integrity of the roofing system and wall systems, including permanent and temporary flashings, during the entire construction period.

3. The Contractor's responsibilities shall include the cost to repair damage to the existing building's structure, finishes and contents associated with the Contractor's failure to maintain the integrity of the roofing system and wall system including weather-tightness, whether permanent or temporary, at no additional cost to the Owner.

4. The Contractor shall protect paved areas and lawns around the Building from damage associated with the construction. Costs to repair damage to paved areas and lawns will be deducted from Contractor's final payment to cover Owner's expenses to repair damage should the Contractor fail to repair the damages to the Owners satisfaction. The Owner will determine if damages are minor or major.

I. Security: Provide security program and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.

J. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

K. Cleaning during Construction

1. Throughout the construction period the Contractor shall be responsible for maintaining building and site areas affected by the Work in a standard of cleanliness.

    a. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing protection of materials.

    b. Completely remove all scrap, debris, waste material and other items not required for construction from the site at least once a week.

    c. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

2. Conduct daily inspection, more often if necessary, to verify that requirements for cleanliness are being satisfied.

3. Provide required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

4. Use only those cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

L. Removal

1. Unless otherwise specified, materials to be removed, including all components and accessories, become property of the Contractor and shall be promptly removed from the Contract Site and legally disposed of at Contractor's expense.

2. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

3. Clean and repair damage caused by installation or use of temporary facilities. Restore existing facilities used during construction to specified, or to original, condition.

4. The Contractor shall be responsible for removing and disposing of solid wastes (including construction/demolition debris) per Section 01 35 43.

## 1.08 MATERIAL AND EQUIPMENT

A. Products

1. Products include material, equipment, and systems.
2. Comply with Specifications and referenced standards as minimum requirements.
3. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
4. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by the Contract Documents.
5. ACBM (ASBESTOS CONTAINING BUILDING MATERIALS) ARE NOT ALLOWED, materials containing asbestos in any manner or quantity are not allowed on this Project. If such materials are installed they shall be removed and replaced at no additional cost to the Owner.

B. Transportation and Handling

1. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
2. Provide equipment and personnel to handle products by methods to prevent soiling or damage and, when required, to deliver to the designated equipment storage location.
3. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Storage and Protection

1. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
2. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
3. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
4. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

D. Products List

1. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

E. Substitutions

1. Substitutions shall be submitted to Architect/Engineer **a minimum of seven (7) days prior to bid date** for review. Any substitutions not submitted seven (7) days prior to bid date shall not be reviewed or considered.

2. Do not assume that "or Equal" or terms of similar meaning indicate automatic approval of substitute products.

3. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents and state reasons why the substitution will be beneficial to the Owner.

4. Request constitutes a representation that the Contractor:

   a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

   b. Will provide the same warranty for substitution as for specified product.

   c. Waives claims for additional costs, which may subsequently become apparent.

5. The Owner will determine acceptability of proposed substitution, and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

## 1.09 REPORTS

A. Weekly Construction Reports: Prepare a weekly construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions, including presence of rain or snow.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events.
8. Stoppages, delays, shortages, and losses.
9. Orders and requests of authorities having jurisdiction.
10. Change Orders received and implemented.

11. Construction Change Directives received and implemented.
12. Services connected and disconnected.
13. Equipment or system tests and startups.

## 1.10 CONTRACT CLOSEOUT

A. Closeout Procedures

1. Submit Closeout Documentation to the Architect/Engineer 10 days prior to the Substantial Completion Date. The Architect/Engineer shall confirm that the Contractor has fulfilled the Contract Closeout Documentation Requirements 10 days prior to the Substantial Completion Date. The Contractor shall not submit for Final Application for Payment until the Architect/Engineer has notified the Owner that Contractor has fulfilled the Contract Closeout Documentation Requirements.

2. When the Owner considers the Work of this contract has reached Substantial Completion, the Contractor and Owner shall sign a Certificate of Substantial Completion. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. This Certificate of Substantial Completion will be prepared by the Architect/Engineer. When the Certificate of Substantial Completion has been signed by the Owner and the Contractor, the completed Certificate of Substantial Completion shall set the date for Substantial Completion of the work or a designated portion of the work.

3. When the Contractor considers the Work of this contract has reached final completion, the Contractor shall submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for OWNER's inspection. This written notification shall be submitted to the Owner 7 calendar days prior to the proposed inspection date. The Contractor shall not call for final inspection of any portion of the Work that is not complete and permanently installed. The Contractor will be found liable for the re-inspection expenses of individuals called to final inspection meetings prematurely.

4. In addition to submittals required by the conditions of the Contract, provide release of all liens, claims and submit final requisition.

5. The Contractor’s failures to comply with Closeout Procedures, if the Closeout Documentation Requirements are not completed by the Substantial Completion Date. The Owner reserves the right to recover the costs to complete the Closeout Documentation Requirements from the Retainage. The Owner reserves the right to

hire an Architect/Engineer to complete the required Contract Closeout Documentation.

B. Final Cleaning

1. Execute prior to final inspection.

2. Clean site; sweep hard surfaced areas, rake clean other surfaces.

3. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site. Owner will be responsible for cleaning after final acceptance.

C. Project Record Documents

1. Store documents separate from those used for construction.

2. Keep documents current; do not permanently conceal any work until Owner has inspected and required information has been recorded.

3. At Contract Closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

## PART 2 PRODUCTS

Not Used

## PART 3 EXECUTION

### 3.01 FINAL CLEANING

A. Execute final cleaning before final project assessment.

1. Clean Project site, yard, and grounds, in areas disturbed by construction activities of rubbish, waste material, litter, and other foreign substances.

2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits. Rake landscaped areas.

3. Remove tools, construction equipment, machinery, and surplus material from Project site.

4. Clean exposed interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.

5. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

6. Sweep hard flooring surfaces broom clean.

7. Vacuum carpet and similar soft surfaces, removing debris; clean according to manufacturer's recommendations if visible soil or stains remain.

8. Clean transparent materials, including mirrors and glass in doors and windows.

9. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

10. Remove labels that are not permanent.

11. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and other foreign substances.

12. Replace filters of operating equipment.

13. Remove waste and surplus materials, rubbish, and construction facilities from site.

14. Leave Project clean and ready for occupancy.

## 3.02 STARTING OF SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems in accordance with the specifications as listed in specific sections.

B. Notify Architect/Engineer seven days before start-up of each item.

C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer's factory authorized service organization in accordance with manufacturers' instructions and as such not to void the manufacturer's warrantee.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or

system installation before start-up, and to supervise placing equipment or system in operation.

H. Submit a written report(s) stating the equipment or system has been properly installed, started and is functioning correctly. Include such reports in the Closeout Documents.

## 3.03 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks before date of Substantial Completion.

B. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at equipment location.

D. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instruction.

E. Required instruction time for each item of equipment and system is specified in individual sections.

## 3.04 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

## 3.05 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed Shop Drawings, Product Data, and Samples.

6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Product substitutions or alternates used.

3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish main floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of the Work.

4. Field changes of dimension and detail.

5. Details not on original Contract drawings.

G. Submit Closeout Documentation to the Architect/Engineer 10 days prior to the Substantial Completion Date. The Architect/Engineer shall confirm that the Contractor has fulfilled the Contract Closeout Documentation Requirements 10 days prior to the Substantial Completion Date.

## 3.06 OPERATION AND MAINTENANCE DATA

A. Submittal Requirements:

1. Submit three (3) copies of data on 8-1/2 x 11-inch text pages, bound in three (3) separate D side ring binders with durable plastic covers. **Contractor shall also provide O&M Manual in electronic form on CD/DVD**.

2. Prepare binder cover with printed title "OPERATION AND MAINTENANCE", title of project, location, bid number, and subject matter of binder when multiple binders are required. A spine label with same information should also be provided.

3. Subdivide each binder's contents with permanent page dividers, logically organized, with tab titles clearly printed. Tabs should be organized and titled based on the Table of Contents.

B. Manual Submission

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

3. Submit one copy of completed volumes 15 days before final inspection. Draft copy will be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required before final submission.

4. Submit two sets of revised final volumes in final form within 10 days after Receipt from Owner.

C. Contents

1. Project Summary: The first page in binder should include a paragraph describing the Project followed by a Contact List. The Contact List is to include Owner name along with company name, contact name, address, and telephone number for the Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Drawings: Provide reduced copies of each plan printed on 11 x 17 pages and insert them after the Project Summary page. Also provide a CD/DVD in the back of each binder containing Record Drawing files in Adobe PDF format. AutoCAD drawings shall be delivered as stand-alone without X-references.

3. Table of Contents: Provide a Table of Contents (TOC) for the binder and place behind the reduced plans. If multiple binders are necessary, include a TOC for the entire submission, then a TOC for the individual binder. TOC should be a listing of all products or systems and the 6 required components below each.

4. Product/System Components: Provide the following information for each product and/or system. Provide additional requirements as specified in individual product specification sections.

    a. OVERVIEW and INFORMATION:
        i. Equipment Register: equipment description, model number(s), date of installation, installer w/contact info, supplier w/contact info, manufacturer w/contact info, warranty date, warranty details, estimated life / useful life.
        ii. Description of Complete Installation: A general description of the installation to provide a general understanding of the equipment and its operation.
        iii. Specific System Description: A technical description of each system of the installation, written to ensure it can be clearly understood by persons not familiar with the installation.
        iv. Performance Data: Technically description of the mode of operation of each system provided. This section provides functionality details.
        v. When applicable, include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

    b. OPERATIONS:
        i. Manufacturers' technical literature as appropriate. For other than common accessories, where no manufacturer literature is available, provide a precise and concise description of the operation procedure in plain English.
        ii. Safe start-up, break-in, routine operation, shut-down, and emergency operations for the equipment installed including a logical step-by-step sequence of instructions for each procedure. Include summer, winter and special operating instructions.
        iii. List of all limiting conditions for equipment.
        iv. Control Sequence and flow diagrams for the system installed.
        v. A legend for color-coded services. A legend of the symbols used on the drawings, unless included on the drawings.
        vi. Schedules of the parameter settings of each protective device, including fixed and adjustable circuit breakers, protective relays, adjustable photoelectric switches, pressure switches, and any other control and monitoring device, as established during commissioning and maintenance.

c. MAINTENANCE:
   i. Emergency procedures, including telephone numbers for emergency services, and procedures for fault-finding.
   ii. Manufacturers' technical literature, as appropriate. Include original manufacturers' parts list, illustrations, assembly drawings, and diagrams required for maintenance.
   iii. Detailed recommendations for the frequency of performance of routine maintenance tasks
   iv. List of procedures and tasks associated with preventative (routine) maintenance.
   v. Procedures for safe trouble shooting, disassembly, repair and reassembly, cleaning, alignment, inspection and adjustment, including a logical step-by-step sequence of instructions for each procedure.
   vi. Include summer, winter and special maintenance instructions.
   vii. Maintenance Schedule: schedule of the frequency of the required or recommended maintenance, testing and inspection for each type of equipment. The schedule is to include weekly and monthly attendance times.
   viii. Installation and dismantling instructions: Instructions for the proper installation and dismantling of the equipment.
   ix. Spares and Consumables:
      1. Schedule of spares (including bearings) with an expected operating life less than 40,000 hours. Include expected replacement frequency, item label manufacturer name, address, and telephone number, catalogue number name and address of local distributor.
      2. Schedule of Consumable Items (oil, grease, belts, bearings) to be used during servicing.
      3. Furnish spare parts, consumable items, and extra products in quantities specified in individual specification sections and/or as recommended by manufacturer or requested by Owner. Deliver to project site and place in location as directed by Owner; *obtain receipt before final payment*.

d. TECHNICAL DATA
   i. Manufacturers' technical literature assembled specifically for the project and **excluding irrelevant material.**
   ii. Each product data sheet marked to clearly identify the specific products and components used in the installation and the data applicable. Additional instructions and illustrations, as required, to identify and changes to the manufacturers' data or to illustrate the function of each component in the installation.
   iii. Provide performance curves and engineering data
   iv. Include control diagrams by controls manufacturer as installed.
   v. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
   vi. Shop drawings.

e. WARRANTIES
   *i.* Provide originals of Manufacturers' warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, *within ten days after completion of applicable item of work.*
   ii. All Guarantees
   iii. Certificates of compliance for all electrical and plumbing works, where applicable.
   iv. If installation is not by the manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's approval of the installing firm.

## 3.07 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

B. Verify documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Submit before final Application for Payment.

E. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

2. Make other submittals within ten days after Date of Substantial Completion, before final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

**END OF SECTION 01 00 00**

City Hall Chiller Replacement,  Auburn, Maine
Bid No. 2018-001

# SECTION 01 35 43
# ENVIRONMENTAL PROTECTION

## PART 1 - GENERAL

### 1.01 DEFINITIONS OF CONTAMINANTS:

A. Sediment: Soil and other debris that has been eroded and transported by runoff water.

B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations, and from community activities.

C. Rubbish: A variety of combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans and bones.

D. Debris: Includes combustible and noncombustible wastes such as ashes, waste materials that result from construction or maintenance and repair work, leaves, and tree trimmings.

E. Chemical Wastes: Includes salts, acids, alkalies, herbicides, pesticides, and organic chemicals.

F. Sanitary Wastes: See Section 01 00 00, para. 1.07. E.1.

G. Sewage: Wastes characterized as domestic sanitary sewage.

H. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

I. Oily Waste: Includes petroleum products and bituminous materials.

### 1.02 ENVIRONMENTAL PROTECTION REQUIREMENTS:

A. General:

1. Provide and maintain during the life of the contract, environmental protection as defined herein. Provide environmental protective measures as required to control pollution that develops during normal construction practice. Provide also environmental protection measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution.

## PART 2 - PRODUCTS: NOT USED

## PART 3 - EXECUTION

### 3.01 PROTECTION OF NATURAL RESOURCES:

A. General:

1. The natural resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specifications.

B. Land Resources:

1. Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special approval of the Owner. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

C. Protection:

1. Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operators. Remove displaced rocks from uncleared areas. Protect monuments, markers and works of art.

D. Repair and Restoration:

1. Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment operations. Obtain approval of the repair or restoration from the Owner prior to its initiation.

E. Temporary Construction:

1. Obliterate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and all other vestiges of construction. Temporary roads, parking areas, and similar temporary use areas shall be graded in conformance with surrounding areas, tilled, and seeded. Include topsoil or nutriment during the seeding operation as necessary to establish a suitable stand of grass.

F. Water Resources:

1. Perform all work in such a manner that any adverse environmental impact on water resources is reduced to a level acceptable to the Owner.

G. Oil Substances:

1. Take special measures to prevent oily or hazardous substances from entering the ground, drainage areas or local bodies of water. Surround all temporary fuel oil, petroleum, or liquid chemical storage tanks with a temporary berm of sufficient size and strength to contain the contents of the tanks in the event of content leakage or spillage.

H. Fish and Wildlife Resources:

1. During the performance of the work take such steps as required to prevent interference or disturbance to fish and wildlife. Do not alter water flows or otherwise significantly disturb native

habitat adjacent to the project area which are critical to fish and wildlife except as may be indicated or specified.

I. Historical and Archaeological Resources:
   1. Carefully preserve and report immediately to the Owner all items having any apparent historical or archaeological interest which are discovered in the course of any construction activities.

**3.02 EROSION AND SEDIMENT CONTROL MEASURES:**

A. Burn-off:

   1. Burn-off of ground cover is not permitted.

B. Protection of Erodible Soils:

   1. All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and backslopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected soils.

C. Temporary Protection to Erodible Soils:

   1. Utilize the following methods to prevent erosion and control sedimentation.

D. Mechanical Retardation and Control of Runoff:

   1. Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

E. Vegetation and Mulch:

   1. Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such contamination of these and other methods necessary for effective erosion control.

**3.03 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES:**

A. General:

   1. Handle and dispose of wastes in accordance with this specification section. If directions conflict with another included specification, the other specification shall take precedence.

   2. Track the disposal of all solid, hazardous and chemical wastes and provide Waste Disposal Tracking as required by Local, State and Federal regulations.

3. The preparation, cooking, and disposing of food is strictly prohibited on the project site.

4. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Obliterate signs of temporary construction and activities incidental to construction of permanent work in place.

B. Solid Wastes:

1. Pick up solid wastes and place in containers which are emptied on a regular schedule at the Contractor's expense.

2. Solid wastes shall be recycled whenever practicable.

3. The Contractor shall be responsible for contacting disposal facilities to determine what types of solid waste they will accept. The Contractor shall dispose of solid wastes only at facilities allowed to accept such material per Federal, State, and Local regulations.

C. Sewage, Odor, and Pest Control:

1. Dispose of sewage through connection to an authorized sanitary sewage system. Where such a system is not available, use chemical toilets or comparable effective units and periodically empty wastes. Include provisions for pest control and elimination of odors.

D. Chemical Wastes:

1. Store chemical waste in corrosion resistant containers labeled to identify type of waste and date filled. Remove containers from the project site, and dispose of chemical waste in accordance with Federal, State, and Local regulations. For oil and hazardous material spills which may be large enough to violate Federal, State, or Local regulations, notify the Owner and appropriate regulating Agency immediately.

E. Petroleum Products:

1. Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting Federal, State and Local regulations.

**3.04 DUST CONTROL:**

A. General:

1. Keep dust down at all times, including nonworking hours, weekends, and holidays. Sprinkle or treat with dust suppressors, the soil at the site, haul roads, and other areas disturbed by operations. Petroleum products will not be used as suppressors. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning of non-particulate debris, such as steel reinforcing bars. No unnecessary shaking of bags is permitted where bagged cement, concrete mortar and plaster is used.

**3.05 NOISE:**

A. General:
1. When available, make the maximum use of "low-noise-emission products" as certified by EPA. No blasting or use of explosives is permitted without written permission of the Owner and then only during designated times.

**END OF SECTION 01 35 43**

# SECTION 01 73 29

# CUTTING AND PATCHING

## PART 1 GENERAL

### 1.01 SUMMARY

A. Section includes procedural requirements for cutting and patching.

### 1.02 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

### 1.03 RELATED REQUIREMENTS

A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS

B. Section 01 35 43 – ENVIRONMENTAL PROTECTION

C. Section 02 41 00 – DEMOLITION

### 1.04 QUALITY ASSURANCE

A. General: Contractor shall take reasonable care prior to all cutting and drilling in order to minimize unintended damage to concealed conduits, cables, pipes, reinforcing steel, etc. In circumstances where the absence of such concealed elements is not established conclusively, utilize detection and mapping technology, e.g., X-ray or Sub-surface Interface Radar (SIR), to locate any such elements that may be present before proceeding with the cutting or drilling work.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational Elements include but are not limited to the following:

1. Air or smoke barriers.
2. Fire-protection systems.
3. Control systems.
4. Communication systems.
5. Conveying systems.
6. Electrical wiring systems.
7. Operating systems of special construction.

D. Miscellaneous Elements: Do not cut and patch elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in an increased maintenance or decreased operational life or safety. Miscellaneous Elements include but are not limited to the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings [that are scheduled to remain].
3. Exterior curtain-wall construction.
4. Equipment supports.

5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

## 1.05 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

# PART 2 PRODUCTS

## 2.01 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing and In-Place Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, shall match the visual and functional performance of existing materials.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

## 3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting, patching and demolition to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to prevent interruption of services to occupied areas.
   1. If existing services to occupied areas must be interrupted, coordinate and receive approval of the interruption of services prior to starting work.

## 3.03 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that shall eliminate evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      b. Restore damaged pipe covering to its original condition.

D. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   1. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

E. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance. Patch and paint ceilings where existing equipment (i.e. light fixtures) are scheduled to be removed.

F. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

G. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

**END OF SECTION 01 73 29**

# SECTION 23 00 00

# MECHANICAL

## PART 1 - GENERAL

### 1.01 RELATED DOCUMENTS

General Provisions of Contract, including General and Supplementary conditions and General Requirements (if any) apply to work specified in this Section.

### 1.02 BIDDING OPTIONS

The Contractor can elect to:

Bid only Owner Options A&C and Add Alternates D, E & F
Or
Bid only Owner Options B&C and Add Alternates D, E & F
Or
Bid both Owner Options A, B & C and Add Alternates D, E & F

OWNER OPTION A
Chiller to be Screw Compressor Type
OWNER OPTION B
Chiller to be Scroll Compressor Type
OWNER OPTION C
Supply, deliver and unload (but not install) Chilled Water Pump as specified
ADD ALTERNATE D
Substantially complete chiller shut-down to chiller start-up from Noon on Friday to the following Monday by 7:00am.
ADD ALTERNATE E
Provide an extended 5-year full unit warranty on the chiller including compressor(s)
ADD ALTERNATE F
Provide an extended 10-year full unit warranty on the chiller including compressor(s)

### 1.03 WORK SCHEDULE AND LIMITATIONS

1) The maximum downtime for chiller operation to be 72 hours with Owner pre-approval of dates.
2) Regular working hours are M-F 7:00am to 6:00pm
3) Extended hours before 7:00am and after 6:00pm will be available with Owner pre-approval

### 1.03 DEFINITIONS

ATC Automatic Temperature Control

## 1.04 EXISTING SITE CONDITIONS

Responsibilities Prior to Bid: Before submitting a bid, the Mechanical Contractor shall visit and carefully examine site to identify existing conditions and difficulties that may affect the work of this Section. No extra payment will be allowed for additional work caused by unfamiliarity with site conditions.

Responsibilities Prior to Starting Work: Before starting work in a particular area of the project, the Mechanical Contractor shall examine the conditions under which work must be performed including preparatory work performed under other Sections of the Contract, or by the Owner and report conditions which might adversely affect the work in writing to the Engineer. Do not proceed with work until defects have been corrected and conditions are satisfactory. Commencement of work shall be construed as complete acceptance of existing conditions and preparatory work.

## 1.05 DESCRIPTION OF WORK

A. Work Included

1. Furnish all labor, materials, equipment, transportation and perform all operations required to install a complete chiller and related components in the building, in accordance with these specifications and applicable drawings.

2. All temperatures are expressed in degrees Fahrenheit.

3. Perform demolition and removal as required.

   a. All materials to be removed from jobsite.
   b. Recycle or recover all refrigerant per EPA Standards

4. Work to be performed shall include, but is not limited to, the following:

   a. Provide and install replacement Chiller
   b. Rigging and removal of existing Chiller
   c. Cutting, patching and fire stopping
   d. Piping and Pipe Insulation
   e. Automatic Temperature Control (ATC)
   f. Supply and deliver replacement pump
   g. Power Electrical Wiring (as specified in Section 23 10 00)
   h. Tests and balance

5. Specifications and accompanying drawings do not indicate every detail of pipe, valves, fittings, hangers, ductwork and equipment necessary for complete installation; but are provided to show general arrangement and extent of work to be performed.

6. Before submitting proposal, Mechanical Contractor shall be familiar with all conditions. Failure to do so does not relieve Mechanical Contractor of responsibility regarding satisfactory installation of the system.

7. Mechanical contractor shall be responsible for rigging to hoist his own (and his sub-contractors') materials and equipment into place.

8. Mechanical contractor and his sub-contractors shall be responsible for start-up of all equipment provided under this section.

B. Related Work

All work to obtain a complete job is included in this section as well as Section 23 10 00 (Subcontractor to the Mechanical Contactor)

C. Mechanical-Electrical Work

1. Provide and erect all motors, electric heating devices, temperature controls, limit switches as specified.

2. Power supply to switches, fused switches, outlets, electric heating devices, motor starters, to line terminals of equipment, and all related wiring and fuses to properly connect and operate all electrical equipment specified shall be furnished and installed under Section 23 10 00, "MECHANICAL-ELECTRICAL" (Subcontractor to Mechanical Contractor).

3. Section 23 10 00 shall not mount electrical devices directly to outdoor mechanical equipment without the consent of Section 23 00 00. Section 23 10 00 shall not drill wiring holes in equipment casings but shall make use of factory wiring knockouts when present. Coordinate all wiring between Mechanical and Electrical to provide a complete and operating system.

4. All wiring provided under this section shall comply with the requirements of Section 23 10 00 and be in accordance with the latest rules and regulations of the National Fire Underwriters, National Electric code and Local Codes. Install all wiring under the supervision of Section 23 10 00. Any wiring that is not installed according to these standards, and which does not match wiring installed by Section 23 10 00 in type, quality and appearance shall be corrected by Section 23 10 00 at the expense of this section.

5. Automatic Temperature Control (ATC) Systems

Power wiring (as prescribed in this section) and all control wiring shall be furnished and installed by ATC Contractor under supervision of Section 23 00 00. Any wiring that is not installed according to these standards, and which does not match wiring installed by Section 23 10 00 in type, quality and appearance shall be corrected by Section 23 10 00 at the expense of this Section.

Low voltage control wiring must be plenum rated and adequately supported with no sags or "droops". Low voltage wiring need not be installed in conduit unless required by local code.

7. Chiller

Division 23 10 00 (Subcontractor to Mechanical Contractor) shall wire power to line terminals of Chiller.

D. This Contractor shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for the legal installation and operation of the systems and/or equipment furnished under this Section of the Specifications.

## 1.07 CODES, ORDINANCES AND PERMITS

A. All work performed under this Section of the Specifications shall be done in accordance with applicable National, State and local Codes, Laws and Ordinances. The following abbreviations are used for reference to standards which are to be followed:

| | |
|---|---|
| AABC | Associated Air Balance Council |
| ADA | Americans With Disabilities Act |
| AMCA | Air Movement & Control Association |
| ANSI | American National Standards Institute |
| ARI | Air Conditioning and Refrigeration Institute |
| ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| IBC | International Building Code |
| NEC | National Electrical Code |
| NFPA | National Fire Protection Association |
| NEMA | National Electrical Manufacturer's Association |
| OSHA | Occupational Safety and Health Act |
| SMACNA | Sheet Metal and Air Conditioning Contractors National Association |
| UL | Underwriter's Laboratories |

B. The latest issue of each Code in effect at the time of bidding shall be used. Code requirements are the minimum quality and/or performance acceptable. Where the Specifications and/or Drawings indicate more stringent requirements, these requirements shall govern.

## 1.08 QUALITY ASSURANCE

A. Mechanical Contractor shall have prior experience with at least two projects of this nature, size and scope and be capable of producing references indicating as such.

B. Use sufficient qualified workpersons and competent supervisors in execution of this portion of the work to ensure proper and adequate installation of systems throughout. Technical training and certification of workpersons installing the systems specified, by the systems manufacturer, shall be mandatory prior to commencement of work. Documentation of such certification shall be made available to the Architect upon request within 5 business days.

C. Work performed shall conform with all Local and State Rules and Regulations, as well as those of the International Building Code and National Fire Protection Association (N.F.P.A.).

D. Piping design shall conform to ANSI, ASME B31.9 and AWS D10.9 codes.

## 1.09 PLANS AND SPECIFICATIONS

Mechanical Contractor shall provide his sub-contractors with a copy of the entire portion of Part 1 of this specification, portions of this specification and copies of drawings which pertain to the equipment to be supplied at no cost to the sub-contractor. Provide ATC Contractor with entire set of plans and specifications. Provide Testing and Balancing sub-contractor with copies of shop drawings indicating coil GPM's, air handling unit air volumes, etc. Failure to do so may result in the Architect providing the required materials at the Contractor's expense.

Sketches pertaining to changes and amendments during construction (ASI's, RFI's and RFP's for example) shall be contract form documents issued by the Architect and/or Engineer for use during construction and it shall be the Architect's and/or Engineer's discretion to provide sketches or full size drawings. Requests for documentation other than what is provided (full size revised drawings for instance) and deemed suitable for the particular situation shall be paid for by the contractor making the request. The cost(s) shall include, but not limited to, drafting time and reproduction costs.

## 1.10 MATERIALS AND SUBSTITUTIONS

All materials and equipment shall be new and of the latest design of respective manufacturers. All materials and equipment of the same classification shall be the product of the same manufacturer, unless specified otherwise.

A. Any proposal for substitution of Mechanical equipment, materials or vendors not mentioned in this specification shall be made in writing via letter or e-mail to the Architect and/or Engineer up to seven working days prior to opening of bids to permit sufficient time to notify all bidders via addenda. Any requests made after the final addenda prior to bid opening will not be considered. Contractor must certify within his submittals that any equipment or materials requested to be considered as an "approved equal" meets or exceeds the requirements of this specification in all aspects and will physically fit within the space provided while providing adequate clearances for servicing of equipment as required by the manufacturers and will not interfere with other trades. Architect will not be responsible to provide drawings for substituted materials unless the substitution is agreed upon prior to opening of bids.

B. The phrase "or approved equal" shall be defined to mean the Architect shall make final determination whether or not substitute materials are an equal to that which is specified. Materials and equipment determined as an "approved equal" and/or substitutions must meet the same construction standards, capacities, code compliances, etc. as the equipment (i.e. Manufacturer, model, etc.) specified.

C. Approval by Architect for such substitution shall not relieve Mechanical Contractor from responsibility for a satisfactory installation and shall not affect his guarantee covering all

parts of work Architect's decision on acceptability of substitute materials shall be final. Architect's decision on acceptability of substitute materials shall be final.

D. All materials not specified otherwise shall be manufactured within the United States and supplied locally (within the State of Maine) when available. It is preferable to obtain materials that are manufactured within 500 miles of the work site when practical. Manufacturer of Chiller must have local representation.

E. Costs associated with substitutions not previously approved and circulated by adden`da prior to bidding shall be borne by the Section 23 00 00 contractor. Those costs shall include, but not be limited to, electrical, structural, piping, insulation, cutting and patching, etc.

F. It shall be the responsibility of the Contractor to ensure all affected sub-contractors are provided with information specific to their trades regarding substitutions for coordination and pricing (where applicable).

## 1.11 SHOP DRAWINGS & SUBMITTALS

A. As soon as possible after award of contract (*but not longer than 21 calendar days*), before any material or equipment is purchased, Mechanical Contractor shall submit shop drawings for review. Unless prior arrangements are made with the Architect all shop drawings must be submitted to the General Contractor who in turn will forward them to the Architect. The quantity of copies shall be as outlined in Division 01. If shop drawings are rejected or returned for re-submittal, Mechanical Contractor shall provide said re-submittals within 14 calendar days of receipt of original submittals with review comments. If original or re-submitted shop drawings are not submitted within the allotted time frames indicated all substitutions included in the late shop drawings will, at the Architect’s discretion, be invalid and the equipment primarily specified must be provided. Any costs resulting from delays in the project schedule due to failure to submit shop drawings related to this section in a timely manner shall be the responsibility of the Mechanical Contractor. Mechanical Contractor’s and vendor’s name, address, telephone number and e-mail addresses shall be provided with every shop drawing submission. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

B. Shop drawings shall be properly identified and shall describe in detail the material and equipment to be provided, including all dimensional data, performance data clearly indicated, fan curves, pump curves, computer selection print-outs, etc. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

C. Corrections or comments made on the shop drawings do not relieve the Contractor from compliance with requirements of the drawings and specifications. Shop drawing review is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

D. Should any materials or products be purchased and/or installed without prior review and comment the Contractor shall be required to remove or replace those products and/or materials, if directed by the Architect, at his expense. If the materials are not removed (or replaced) or if the project is delayed as a result of the Contractor's actions, the Architect reserves the right to order the withholding of payment until the situation is resolved in a manner satisfactory to the Architect.

E. Review must be obtained on the following items:

1. Mechanical Equipment

   a. Full warrantee information must be included with all submittals.
   b. Chiller
   c. Equipment identification tags

2. Piping and Accessories

   a. Piping, fittings, unions and flanges
   b. Pipe hangers and insulated pipe supports
   c. Valves
   d. Pipe markers
   e. Exterior piping support systems.
   f. Propylene Glycol

3. Insulation

   a. Piping

4. Automatic Temperature Control (ATC) System

## 1.12 PRODUCT HANDLING

A. Protection

Use all means necessary to protect heating, ventilating and air conditioning materials before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacements

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

## 1.13 MAINTENANCE MANUAL

A. On completion of this portion of the work, and as a condition of its acceptance, and in accordance with Division 01, submit for approval two copies of a manual describing the

system. Mechanical equipment manuals shall be separate from plumbing manuals. All manuals shall be original copies, not photocopies or they will be refused for re-submittal. Prepare manuals in durable 3-ring binders approximately 8½ inches by 11 inches in size with at least the following:

1. Identification on the front cover and spine stating general nature of the manual.
2. Neatly typewritten index.
3. Complete instructions regarding operation and maintenance of all equipment involved.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name, address and telephone number of nearest vendor of parts.
5. Copy of all guarantees and warranties issued.
6. Where contents of manuals including manufacturer's catalog pages, clearly indicate the precise item included in this installation and delete, or otherwise clearly indicate, all manufacturers' data with which this installation is not concerned.
7. Copies of signed documentation of factory startup signed by an authorized factory technicians for pumps and boilers.

B. In addition to above, provide two (2) separate offset style binders properly identified, each containing a copy of all reviewed shop drawings and catalog cuts. These may be incorporated in Maintenance Manuals, if binders are of adequate size. Also, include (2) CD’s with all electronic shop drawings and catalog cuts.

## 1.14 OBJECTIONABLE NOISE AND VIBRATION

Mechanical equipment shall operate without objectionable noise and vibration. Should objectionable noise or vibration be transmitted to any occupied part of the building by apparatus, piping or ducts, as determined by the Architect, the necessary changes eliminating the noise or vibration shall be made by this Mechanical Contractor at no extra cost to the Owner.

## 1.15 GUARANTEE

This Contractor shall guarantee all materials and workmanship furnished by him or his sub-contractors to be free from all defects for a period of no less than one (1) year from date of final acceptance of completed system and shall make good, repair or replace any defective work which may develop within that time at his own expense and without expense to the Owner. Any additional costs required to extend manufacturer's guarantee and warranty for the period specified, shall be included in Contractor's base bid.

## 1.16 DEVIATIONS AND DISCREPANCIES

A. The drawings are intended to indicate only diagrammatically the extent, general character and approximate locations of mechanical work. Work indicated, but having minor details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. Follow the architectural, structural, plumbing and electrical drawings so that work under this section is properly installed and coordinated with other Sections.

B. The drawings and specifications are complimentary to each other and what is called for in one, shall be as binding as if called for by both. In the event of conflicting information on Div. 23 drawings, or between Div. 23 drawings and this specification notify the Architect immediately so a clarification may be issued by addenda.

C. Questions to the Architect and/or Engineers are encouraged, however any answers and/or advice is non-binding unless incorporated into the contract documents in the form of addenda, change order, etc. Inquiries requiring an answer prior to opening of bids should be made at least seven days prior to when bids are due to allow time for a clarifying addendum to be issued.

D. Any conflicts arising from duplication of equipment specified in different portions of the specifications shall be brought to the attention of the Architect prior to submitting bids. Failure to do so does not relieve the Contractor from responsibility of providing said materials and equipment and a credit will be taken for the duplicated item(s).

E. Should unforeseen job conditions require re-arrangement of piping and/or ductwork resulting in deviation from the intent of the contract documents or potentially compromising the integrity of the mechanical systems, the Architect shall be notified immediately prior to commencement of work. Failure to do so will result in the Contractor being responsible to correct any work installed that is contrary to the contract documents at his own expense.

## 1.17 CHANGE ORDERS

A. No change shall be made from the layout, work, equipment, or materials under this section except as directed in writing by Architect.

B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

## 1.18 COORDINATION

A. Contractor shall be responsible to coordinate his work with that of other trades to adjust to field conditions prior to commencing work. It is also this Contractor's responsibility to coordinate locations of his own piping and ductwork to ensure the two do not conflict. If a reasonable solution cannot be achieved without compromising the integrity of the intended design or would result in additional cost, the Architect must be notified immediately prior to commencement of work. Failure to do so does not relieve the Contractor from providing and installing the systems to the satisfaction of the Architect at no additional cost.

B. Contractor shall be responsible to review job conditions and identify conflicts and/or obstructions to ductwork and piping prior to fabrication. If conflicts and/or obstructions are noted the Architect must be notified immediately prior to commencement of work. The cost of any fabrication work performed without confirmation and notification of conflicts and/or obstructions shall be the responsibility of the Contractor.

## 1.19 REQUESTS FOR INFORMATION

Requests for Information (RFI) or other correspondences which are submitted electronically must be in an open format, meaning files must not be locked and comments may be added without altering the original content, or have interactive fields intended specifically for commenting. No software other than Microsoft Word, Microsoft Excel and Adobe Acrobat Standard shall be required to open files or make comments.

## 1.20 WORKPLACE SAFETY

Mechanical Contractor shall be responsible for the safety of his and his subcontractors workpeople.

# PART 2 - PRODUCTS

## 2.01 PIPING

A. General

Provide and erect in accordance with best practice of trade all refrigerant and drain piping shown on the plans and as required to complete intended installation. Contractor shall make offsets as shown or required to place all piping in proper position to avoid other work, and to allow application of insulation and finish painting.

B. Pipe Materials:

Chilled Water Piping: Schedule 40 standard weight black, Steel ASTM 120

C. Pipe Fittings:

1. Welded

All mains 2½ inches and larger shall have welded connections using standard factory-fabricated tees, elbows, reducers, and caps. Branch outlets in welded sizes shall be made with tees for full size or one size reduction and with either "Weldolets" and "Threadolets" or factory shaped nipples for all other sizes. All welds shall be made by welders certified by the State of Maine and shall be capable of welding in any position "in the field". All welds shall conform with the rules set forth in the Standard Manual on Pipe Welding of the Heating, Piping and Air Conditioning Contractors National Association. All slip on fittings shall be back welded.

2. Victaulic Grooved Pipe (provided a 2-year material warranty is included)

a. The Mechanical Contractor may also, at his option, use Victaulic grooved piping products in lieu of welded joints on steel piping. All grooved components shall be of one manufacturer and conform to local code approval and/or as listed by ANSI B-31.1, B-31.9, ASME, UL-FM, IAPMO. Grooved end product manufacturer to be ISO-9001 certified.

b. Pipe to be grooved in accordance with Victaulic current listed standards conforming to ANSI/AWWA C-606.

c. Mechanical couplings shall be Victaulic Style 107H QuickVic™ "Installation Ready" stab-on coupling and Victaulic Style 07 Zero-Flex standard rigid coupling. Victaulic Style 177 QuickVic and Victaulic Style 77 or 75 standard coupling shall be used where system flexibility is desired at pumps and other mechanical equipment to reduce noise and vibration and eliminate flexible connectors. Vic-Flange adapter Style 741 shall be used for connections to ANSI class 125/150 flanged components. Gasket shall be Grade EHP EPDM compound with a temperature operating range -30°F to +250°F and Grade E EPDM compound with a temperature operating range -30°F to +230°F.

d. Fittings shall be cast ductile iron conforming to ASTM A 536, forged steel conforming to ASTM A 234, or fabricated from carbon steel pipe conforming to ASTM A 53 with factory grooved ends designed to accept Victaulic stab-on, standard, and AGS "W" series couplings.

## 2.02 INSULATION AND PIPE COVERING

A. Insulate all new Supply and Return Chilled Water Piping. The design intention is to duplicate the existing insulation.

B. Insulation to be 2" Fiberglass. Field verify existing insulation and duplicate.

C. Weatherproof pipe cover to be corrugated aluminum with manufacturer recommended banding.

D. Piping and fittings exposed to the elements shall have the insulation covered with ultraviolet resistant vinyl outdoor PVC jacket, JohnsManville Zeston 300 or approved equal

E. Caulk all joints weathertight.

## 2.03 PROPYLENE GLYCOL

a. Recharge chiller piping with a 20% premixed propylene glycol mixture.

b. Glycol: Inhibited, nonflammable propylene glycol, low toxicity with density 8.65 lbs. per gallon and reserve alkalinity of 11 - 12. Provide a 20% (by volume) concentration of glycol in the chilled water system. Glycol shall be Proco 1000 by Chute Chemical Co. of Bangor, Maine, Safe-T-Therm by Houghton Chemical Corp. of Allston, Ma. (http://www.houghton.com) or approved equal.

## 2.04 CHILLER C-1 (OWNER OPTION A – SCREW COMPRESSORS)

A.. General

Units are leak and pressure tested at 390 psig (2689 kPa) high side, 250 psig (1724 kPa) low side, then evacuated and charged All Air-cooled Series R(T M) chillers are factory tested to confirm operation prior to shipment Packaged units ship with full operating charge of oil and refrigerant. Unit panels, structural elements and control boxes are constructed of galvanized steel and mounted on a welded structural steel base. Unit panels and control boxes are finished with a baked-on powder paint, and the structural base with an airdry paint. All paint meets the requirement for outdoor equipment of the U.S Navy and other Federal Government Agencies and meets ASTM B117 500 hours salt spray fog test. Anytime water only is present in the evaporator, the Trane CH530 must have flow control of the chilled water system Flow control can be done either directly or through an input to a building automation system to conduct an action resulting in minimum flow through the chiller evaporator barrel to avoid potentially catastrophic damage to the evaporator due to freezing ~ the system has sufficient glycol to protect down to the lowest expected ambient, now control is optional

B. Evaporator

The evaporator is a tube-in-shell heat exchanger design with internally and externally finned copper tubes roller expanded into the tube sheet. The evaporator is designed, tested and stamped in accordance with ASME Pressure Vessel Code Section VIII for a refrigerant side working pressure of 200 psig (1379 kPa). The evaporator is designed for a water side working pressure of 150 psig (1034 kPa). Water connections are grooved pipe Each shell includes a vent, a drain and fittings for temperature control sensors and is insulated with UV resistant 0.75 inch Armaflex II or equal insulation (K=0.28). Insulation also covers the liquid and suction line and evaporator heads. Heaters, with thermostat, are provided to help protect the evaporator from freezing at ambient temperatures down to -20 F (-29 C), depending on application
Note. A separate field supplied low voltage power source is required to power the freeze protection

C. Operating Temperature

Brazed plate refrigerant cooled 01 coolers are provided on the unit, allowing operation in low temperature evaporator, less than 40 F (4 C), modes

D Chilled Water Reset

Provides the control logic and factory-installed sensors to reset leaving chilled water temperature The setpoint can be reset based on ambient temperature or return evaporator water temperature

E. Pressure Vessel Code

Chiller complies with ASME Pressure Vessel Code Section V III ASME nameplates are attached to applicable pressure vessels including oil separators

D. Condenser and Fans

Air-cooled condenser coils have lanced aluminum fins mechanically bonded to internally finned copper tubes The condenser coil has an integral subcooling circuit. Condensers are factory proof and leak tested at 506 psig (3489 kPa). Direct drive vertical discharge condenser fans are dynamically balanced. Three phase condenser fan motors with permanently lubricated ball bearing and internal thermal protection are provided. Units will start and operate down to O F (-18 C) ambient. Totally Enclosed Air-Over (TEAO) motors completely seal motor windings, preventing exposure to ambient conditions TEAO fan motor insulation class F. Unit is also designed to start and operate in high ambient conditions; up to 125 degrees F

E Extra Efficiency/Performance

Provides oversized heat exchangers for two purposes One, it allows the unit to be more energy efficient. Two, the unit will have enhanced operation in high ambient conditions

F. Low Ambient Option

The factory installed low ambient option consists of special control logic and variable frequency drive fans to permit low temperature start-up and operation to 0 F `(-18 C)

G. Compressor Starter -X Line

Starter is an across-the-tine configuration Starters are housed in a weathertight enclosure per UL 1995. Typically, Trane helical rotary compressors are up to full speed in less than one second when started across-the-line

H. Compressor and Lube Oil System

The rotary screw compressor is semi-hermetic, direct drive, 3600 rpm, with step and variable load and unloader valves for capacity control, rolling element bearings, differential refrigerant pressure 01 pump and oil heater The motor is a suction gas cooled. hermetically sealed, two pole squirrel cage induction motor. Oil separation is provided separate from the compressor. Automatically controlled valves are provided on the compressor discharge and lube oil system A solenoid valve in the lube oil return system is also provided Oil filtration is accomplished by an integral oil filter located within the compressor

I. Refrigerant Circuits

Each unit has two refrigerant circuits, with one rotary screw compressor per circuit Each refrigerant circuit includes discharge service valve, liquid line shutoff valve (except remote evap), removable core filter, liquid line sight glass, charging port, one electronic expansion valve per circuit and optional compressor suction service valve. Fully modulating compressors and electronic expansion valves provide variable capacity modulation over the entire operating range

J. Unit Controls

All unit controls are housed in a outdoor rated enclosure per UL 1995 with removable plates to allow for customer connection of power wiring and remote interlocks. All controls, including sensors, are factory mounted and tested prior to shipment. Microcomputer controls provide all control functions including start up and shutdown, leaving chilled water temperature control, compressor and electronic expansion valve modulation, fan sequencing, anti-recycle logic, automatic leadl1ag compressor starting, load limiting and chilled water pump control. The unit control module with Rapid Restart (TM), utilizing Adaptive Control (TM) microprocessor automatically takes action to avoid unit shutdown due to abnormal operating conditions associated with low refrigerant pressure, high condensing pressure and motor current overload. Should the abnormal operating condition continue until a protective limit is violated, the unit will be shut down. A control power transformer is factory installed and wired

K. Controls Function Data

Unit protective functions include loss of chilled water now, evaporator freezing, loss of refrigerant, low refrigerant pressure, high refrigerant pressure, compressor starting and running over current, phase loss, phase imbalance, phase reversal, under/over voltage protection and loss of oil now. A menu driven digital display indicates over 20 operating data points including chilled water set point, current limit set point, entering and leaving chilled water temperature, evaporator and condenser refrigerant pressures and temperatures. Over 60 diagnostic checks are made and displayed when a problem is detected. The digital display can be read and advanced on the unit without opening any control panel doors. Touch screen LCD, allows for easy access of all important chiller operating information

L. Short Circuit Current Rating (SCCR)

A short circuit current rating offers a measure of safety for what the starter panel enclosure is able to withstand in the event of an explosion caused by a short circuit

M. Power Connection

Power connections include main three phase power and two separate 115V, 15 amp fiekl provided single phase power connections to power the convenience outlet and the evaporator heaters (if used for freeze protection). Fiekl wiring connection point will be on the bottom right corner of the electrical panel

N. 115V Convenience Outlet (60 Hz)

Convenience outlet is provided for 115V power service at the chiller

O. Flow Switch

There is a factory installed flow switch with a velocity setpoint of 15 cm/sec included on this chiller. Flow switch setting is based on chiller design conditions

P. Warranty

Standard Warranty (The refrigeration equipment manufacturer's guarantee shall be for a period of one year from date of equipment start-up but not more than 18 months from shipment. The guarantee shall provide for repair or replacement due to failure by material and workmanship that prove defective within the above period, excluding refrigerant.

Q. Factory Start-up

1. Provide testing and starting of machine, and instruct the Owner in its proper operation and maintenance.
2. Start-up shall be completed by a factory authorized service organization.

## 2.05 CHILLER C-1 (OWNER OPTION B – SCROLL COMPRESSORS)

B. SUMMARY
1. Section includes design, performance criteria, refrigerants, controls, and installation requirements for air-cooled scroll compressor chillers.

C. REFERENCES
1. Comply with applicable Standards/Codes of AHRI 550/590, ANSI/ASHRAE 15, ETL, cETL, NEC, and OSHA as adopted by the State.
2. Units shall meet the efficiency standards of the current version of ASHRAE Standard 90.1, and FEMP standard 2012.

D. SUBMITTALS
1. Submit shop drawings and product data in accordance with the specifications.
2. Submittals shall include the following:
   a) Dimensioned plan and elevation view drawings, required clearances, and location of all field connections
   b) Summary of all auxiliary utility requirements such as electricity, water, etc. Summary shall indicate quality and quantity of each required utility.
   c) Single line schematic drawing of the field power hookup requirements, indicating all items that are furnished.
   d) Schematic diagram of control system indicating points for field interface/connection.
   e) Diagram shall fully delineate field and factory wiring.
   f) Installation and operating manuals.

E. QUALITY ASSURANCE
1. Qualifications: Equipment manufacturer must specialize in the manufacture of the products specified and have five-years experience with the type of equipment and refrigerant offered.
2. Regulatory Requirements: Comply with the codes and standards specified.
3. Chiller manufacturer plant must be ISO Registered.

F. DELIVERY AND HANDLING

1. Chiller shall be delivered to the job site completely assembled and charged with refrigerant and oil by the manufacturer.
2. Comply with the manufacturer's instructions for rigging and handling equipment.

G. WARRANTY

Standard Warranty (The refrigeration equipment manufacturer's guarantee shall be for a period of one year from date of equipment start-up but not more than 18 months from shipment. The guarantee shall provide for repair or replacement due to failure by material and workmanship that prove defective within the above period, excluding refrigerant.

H. MAINTENANCE

1. Maintenance of the chillers shall be the responsibility of the owner and performed in accordance with the manufacturer’s instructions

I. DESIGN MANUFACTURER

Daikin Applied

APPROVED EQUAL MANUFACTURERs

Trane, York/JCI

J. UNIT DESCRIPTION

1. Provide and install as shown on the plans factory-assembled, factory-charged air-cooled scroll compressor packaged chillers in the quantity specified. Each chiller shall consist of hermetic trio scroll compressor sets (total six compressors), brazed plate evaporator, air-cooled condenser section, microprocessor-based control system and all components necessary for controlled unit operation.
2. Chiller shall be functionally tested at the factory to ensure trouble free field operation

K. DESIGN REQUIREMENTS

1. Flow Range: The chiller shall have the ability to support variable flow range down to 40% of nominal design (based on AHRI conditions).
2. Operating Range: The chiller shall have the ability to control leaving chilled fluid temperature from 15F to 65F.
3. General: Provide a complete scroll compressor packaged chiller as specified herein and as shown on the drawings. The unit shall be in accordance with the standards referenced in section 1.02 and any local codes in effect.
4. Performance: Refer to the schedule of performance on the drawings. The chiller shall be capable of stable operation to a minimum percentage of full load (without hot gas bypass) of 17%. Performance shall be in accordance with AHRI Standard 550/590.
5. Acoustics: Sound pressure levels for the unit shall not exceed the following specified levels. All manufacturers shall provide the necessary sound treatment ( parts and labor) to meet these levels if required. Sound data shall be provided with the quotation. Test shall be in accordance with AHRI Standard 370.

| Sound Pressure (at 30 feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | **Overall dBA** | 75% Load dBA | 50% Load dBA | 25% Load dBA |
| | | | | | | | | | | | |
| **Sound Power** | | | | | | | | | | | |
| 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | **Overall dBA** | 75% Load dBA | 50% Load dBA | 25% Load dBA |
| | | | | | | | | | | | |

L. CHILLER COMPONENTS

1. Compressor
   a) The compressors shall be sealed hermetic, scroll type with crankcase oil heater and suction strainer. The compressor motor shall be refrigerant gas cooled, high torque, hermetic induction type, two-pole, with inherent thermal protection on all three phases and shall be mounted on RIS vibration isolator pads. The compressors shall be equipped with an internal module providing compressor protection and communication capability.
2. Evaporator
   a) The evaporator shall be a compact, high efficiency, dual circuit, brazed plate-to-plate type heat exchanger consisting of parallel stainless steel plates.
   b) The evaporator shall be protected with an external, electric resistance heater plate and insulated with 3/4" (19mm) thick closed-cell polyurethane insulation. This combination shall provide freeze protection down to -20°F (-29°C) ambient air temperature.
   c) The water-side working pressure shall be a minimum of 653 psig (4502 kPa). Evaporators shall be designed and constructed according to, and listed by Underwriters Laboratories (UL).
3. Condenser
   a) Condenser fans shall be propeller type arranged for vertical air discharge and individually driven by direct-drive fan motors. The fans shall be equipped with a heavy-gauge vinyl-coated fan guard. Fan motors shall be TEAO type with permanently lubricated ball bearings, inherent overload protection, three-phase, direct-drive, 1140 rpm. Each fan section shall be partitioned to avoid cross circulation.
   b) Coil shall be microchannel design and shall have a series of flat tubes containing multiple, parallel flow microchannels layered between the refrigerant manifolds. Tubes shall be 9153 aluminum alloy. Tubes made of 3102 alloy or other alloys of lower corrosion resistance shall not be accepted. Coils shall consist of a two-pass arrangement. Each condenser coil shall be factory leak tested with high-pressure air under water. Condenser coils shall include ElectroFin™ baked epoxy coating providing 6000+ hour salt spray resistance (ASTM B117-90) applied to both the coil and the coil frames.

4. Refrigerant Circuit
   a) Each of the two refrigerant circuits shall include a replaceable-core refrigerant filter-drier, sight glass with moisture indicator, liquid line solenoid valve (no exceptions), expansion valve, and insulated suction line.
5. Construction
   a) Unit casing and all structural members and rails shall be fabricated of pre-painted or galvanized steel. Painted parts shall be able to meet ASTM B117, 1000-hour salt spray test.
   b) Upper section of unit shall have protective and decorative louvers covering the coils and unit end; base section of unit shall have protective, 12 GA, PVC-coated, wire grille guards and have painted steel wraps enclosing the coil end sections and piping.
6. Control System
   a) A centrally located weatherproof control panel shall contain the field power connection points, control interlock terminals, and control system. Box shall be designed in accordance with NEMA 3R rating. Power and starting components shall include factory circuit breaker for fan motors and control circuit, individual contactors for each fan motor, solid-state compressor three-phase motor overload protection, inherent fan motor overload protection and two power blocks (one per circuit) for connection to remote, contractor supplied disconnect switches. Hinged access doors shall be lockable. Barrier panels or separate enclosures are required to protect against accidental contact with line voltage when accessing the control system.
   b) Shall include optional single-point connection to a non-fused disconnect switch with through-the-door handle and compressor circuit breakers.
7. Unit Controller
   a) An advanced DDC microprocessor unit controller with a 5-line by 22-character liquid crystal display provides the operating and protection functions. The controller shall take preemptive limiting action in case of high discharge pressure or low evaporator pressure. The controller shall contain the following features as a minimum:
   b) The unit shall be protected in two ways: (1) by alarms that shut the unit down and require manual reset to restore unit operation and (2) by limit alarms that reduce unit operation in response to some out-of-limit condition. Shut down alarms shall activate an alarm signal.
   c) Shutdown Alarms
      (1) No evaporator water flow (auto-restart)
      (2) Sensor failures
      (3) Low evaporator pressure
      (4) Evaporator freeze protection
      (5) High condenser pressure
      (6) Outside ambient temperature (auto-restart)
      (7) Motor protection system
      (8) Phase voltage protection (Optional)
   d) Limit Alarms
      (1) Condenser pressure stage down, unloads unit at high discharge pressures.
      (2) Low ambient lockout, shuts off unit at low ambient temperatures.

(3) Low evaporator pressure hold, holds stage #1 until pressure rises.

(4) Low evaporator pressure unload, shuts off one compressor.

e) Unit Enable Section

(1) Enables unit operation from either local keypad, digital input, or BAS

f) Unit Mode Selection

(1) Selects standard cooling, ice, glycol, or test operation mode

g) Analog Inputs:

(1) Reset of leaving water temperature, 4-20 mA\

(2) Current Limit

h) Digital Inputs

(1) Unit off switch

(2) Remote start/stop

(3) Flow switch

(4) Ice mode switch, converts operation and setpoints for ice production

(5) Motor protection

i) Digital Outputs

(1) Shutdown alarm; field wired, activates on an alarm condition, off when alarm is cleared

(2) Evaporator pump; field wired, starts pump when unit is set to start

j) Condenser fan control - The unit controller shall provide control of condenser fans based on compressor discharge pressure.

k) Building Automation System (BAS) Interface

(1) Factory mounted DDC controller(s) shall support operation on a BACnet®, Modbus® or LONMARK ® network via one of the data link / physical layers listed below as specified by the successful Building Automation System (BAS) supplier.

(2) BACnet MS/TP

(3) LONMARK® certified.

(4) The information communicated between the BAS and the factory mounted unit controllers shall include the reading and writing of data to allow unit monitoring, control and alarm notification as specified in the unit sequence of operation and the unit points list.

(5) For chillers communicating over a LONMARK network, the corresponding LONMARK eXternal Interface File (XIF) shall be provided with the chiller submittal data.

(6) All communication from the chiller unit controller as specified in the points list shall be via standard BACnet objects. Proprietary BACnet objects shall not be allowed. BACnet communications shall conform to the BACnet protocol (ANSI/ASHRAE135-2001). A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided along with the unit submittal.

M. OPTIONS AND ACCESSORIES

1. The following options are to be included:
   a) Low Ambient Control: Fan VFD allows unit operation from 32°F down to -10°F (-23.3 C).
   b) High Ambient Control Panel for operation from 105°F up to 125°F ambient temperatures
   c) Ground Fault Protection: Factory installed circuit breaker to protect equipment from damage from line-to-ground fault currents less than those required for conductor protection.
   d) Phase loss with under/over voltage protection and with LED indication of the fault type to guard against compressor motor burnout.
   e) BAS interface module to provide interface with the BACnet MSTP protocol.
   f) The following accessories, are to be included:
      (1) Elastomeric vibration isolators for field installation
      (2) Field-mounted, paddle type, chilled water flow switch field wired to the control panel
      (3) Louver Guard

N. INSTALLATION

1. Install in strict accordance with manufacturer's requirements, shop drawings, and contract documents.
2. Adjust and level chiller in alignment on supports.
3. Coordinate electrical installation with electrical contractor.
4. Coordinate controls with control contractor.
5. Install a field-supplied or optional manufacturer-supplied strainer in the chilled water return line at the evaporator inlet that meets manufacturer perforation size specifications.

O. FACTORY START-UP

1. Provide testing and starting of machine, and instruct the Owner in its proper operation and maintenance.
2. Start-up shall be completed by a factory authorized service organization.

## 2.06 CHILLED WATER PUMP (OWNER OPTION C)

A. Supply Pump as specified for owner installation at a future date.

B. Deliver pump to a location in Auburn selected by the owner.

C. Pump Specifications

a. Manufacturer: Crane/Weinman
b. Part Number: 116117
c. Model Number: 4K4A300P
d. Pump is available through Blake Equipment

## 2.07 AUTOMATIC TEMPERATURE CONTROL (ATC)

A. General

1. Furnish and install a complete system of electric/electronic temperature controls.

2. The control system shall be installed by either of the following vendors:

   a. Siemens Control Industries – Siemens Apogee
      Scarborough, Maine

   b. XL Automation – Siemens Talon
      Bangor, Maine

3. ATC Contractor must be capable of providing, installing and servicing the control system in its entirety. Subcontracting of parts or partial sections of the ATC system is not permitted. Exception: Subcontracting of ATC wiring is permissible but the ATC contractor shall be ultimately responsible and liable for proper installation as outlined in Sections 23 00 00 and 23 10 00 of the specifications.

4. The control systems shall be installed by trained control mechanics, regularly employed by the approved vendors, in installation and calibration of ATC equipment. No other vendor will be accepted.

5. Shop drawings of entire control system shall be submitted for approval before work is started.

6. Provide ATC technician to test the complete control systems sequences for specified cycles of operation with the Testing and Balancing Contractor.

7. ATC Contractor must, at the end of the warranty period, furnish the Owner with all access codes and passwords assigned to the control systems. ATC Contractor shall also instruct the Owner in the use of all digital control software and provide a backup copy of the final software package to the Owner on CD.

B. Scope

Control system shall consist of all area sensors, relays, transformers, labor and other accessory equipment, and a complete system of wiring to fulfill intent of ATC specification. Control shall be provided for, but not limited to the following:

1. Chiller C-1

D. Electric Wiring

1. All low voltage and data wiring for installation of temperature controls shall be by ATC Contractor, except as noted. Power wiring for equipment shall be by Division 23 10 00, "MECHANICAL-ELECTRICAL". Exception: Power wiring

from circuit breaker to temperature control panel(s) will be provided and installed by the ATC Contractor.

2. ATC Contractor shall be responsible for coordinating installation of his wiring conduits with Division 23 10 00, "MECHANICAL-ELECTRICAL".

E. Submittal Brochure

The following shall be submitted for approval:

1. Control drawings with detailed wiring diagrams, including bill of material and description of operation for all systems.

2. Product data for all control system components.

F. Instruction and Adjustment

Upon completion of the project, after the ATC systems have been commissioned and are functioning as intended, the ATC Contractor shall:

1. Adjust for use by Owner, all thermostats, controllers, damper operators, and relays provided under this section.

2. Prior to training, furnish two (2) copies of reviewed shop drawings and instruction manuals covering function and operation of control systems for use of the Owner's operating personnel. These shall include manuals of all controls installed and/or wired by the ATC Contractor even if they were provided by different vendors.

3. A competent technician who was involved in the actual installation of the ATC systems shall be provided to thoroughly instruct the Owner's Representative(s) in the care and operation of the ATC system. A representative of the Mechanical Contractor shall also be in attendance through all training. The total period of instruction shall not exceed two (2) hours. Date and time of instruction shall be arranged with the Owner.

G. Guarantee

ATC Contractor shall guarantee his workmanship and materials supplied by him to be free from original defects in both material and workmanship for a period of not less than one (1) year of normal use and service. Guarantees on devices supplied with heat pump systems and electric heating devices shall be covered by the manufacturer of those devices. ATC Contractor shall not be liable to warranty his labor to replace devices not provided by him unless it can be proven damage was done during installation. This guarantee shall become effective starting the date Architect agrees Owner has begun to receive beneficial use of the system.

H. Hazardous Materials

Mercury, or any other material deemed hazardous by the Federal Environmental

Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the ATC system.

K. Sequence of Operation

Existing Sequence of Operation to be maintained.

## PART 3 – EXECUTION

### 3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all work is complete to the point where this installation may properly commence.

2. Verify that Mechanical systems may be installed in strict accordance with all pertinent codes and regulations and the approved shop drawings.

B. Discrepancies

1. In the event of discrepancy, immediately notify Engineer.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

### 3.02 INSTALLATION OF PIPING AND EQUIPMENT

A. General

1. Size and general arrangements as well as methods of connecting all piping, valves, and equipment shall be as indicated, or to meet requirements for complete installation..

2. Install all piping promptly, capping or plugging all open ends and making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.

3. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove all defective materials from the job site.

4. Install pipes to clear all beams and obstructions; do not cut into or reduce the size of load carrying members without the approval of the Architect.

5. All risers and offsets shall be substantially supported.

6. Whenever possible valves shall be installed with the operating stems in the upright position, however when conditions dictate it is acceptable to position valves $90^{o}$ to either side of vertical. Valves shall not be installed with the stems in the downward position.

B. Fire Safety

When welding within 10 feet of combustible materials, fire extinguishing equipment shall be kept within 25 feet of work areas and clearly visible at all times. Contractor shall take additional measures when soldering and welding close to combustibles to protect from ignition. Do not leave the work area unattended until materials being soldered or welded have sufficiently cooled.

## 3.03 CLEANING

Prior to acceptance of the chiller system, thoroughly clean all exposed portions of the Heating, Ventilating and Air Conditioning installation, including the removal all non-permanent labels and all traces of foreign substance.

## 3.04 INSTRUCTIONS

On completion of the job, the Mechanical Contractor shall provide a competent technician to thoroughly instruct the Owner's Representative in the care and operation of the system. The total period of instruction shall not exceed four (4) hours. The time of instruction shall be arranged with the Owner.

## 3.05 RECYCLING

Discarded materials, both new and removed, shall be recycled whenever practical through metal salvage dealers (ductwork, piping, etc.), paper salvage (cardboard shipping containers, etc.), wood & plastic products, etc. The Mechanical Contractor shall retain the salvage value of discarded materials and may use this value to offset his project bid price if so desired. Toxic materials such as adhesives, coolants, refrigerants, etc. shall be disposed of in a manner acceptable to the State of Maine Department of Environmental Protection.

## 3.06 HAZARDOUS MATERIALS

Mercury, asbestos or any other material deemed hazardous by the Federal Environmental Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the mechanical systems.

**END OF SECTION 23 00 00**

**SECTION 23 10 00**
**GENERAL REQUIREMENTS FOR ELECTRICAL WORK**
**AS A SUBCONTACTOR TO THE MECHANCAL CONTRACTOR**
**FOR WORK SHOWN AND SPECIFIED ON M1**

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

1.1.1 Scope: It is the intent of these Specifications is to define the equipment and materials for installation for the Replacement Chiller Project, Auburn City Offices..

1.1.2 Provisions: As used in this section, "provide" means "furnish and install", "furnish" means "to purchase and deliver to the project site complete with every necessary appurtenance and support and to store in a secure area in accordance with manufacturers instructions", and "install" means "to unload at the delivery point at the site or retrieve from storage, move to point of installation and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project".

1.1.3 Existing Site Conditions – Responsibilities Prior to Bid: Before submitting a bid, the Electrical Subcontractor shall visit and carefully examine site to identify existing conditions and difficulties that may affect the work of this Section. No extra payment will be allowed for additional work caused by unfamiliarity with site conditions.

1.1.4 Existing Site Conditions – Responsibilities Prior to Starting Work: Before starting work in a particular area of the project, the Electrical Subcontractor shall examine the conditions under which work must be performed including preparatory work performed under other Sections of the Contract, or by the Owner and report conditions which might adversely affect the work in writing to the Engineer. Do not proceed with work until defects have been corrected and conditions are satisfactory. Commencement of work shall be construed as complete acceptance of existing conditions and preparatory work.

1.1.5 Coordination of Work: The Mechanical Contractor shall coordinate the work of all trades including that of the electrical contractor, with all other subcontractors to determine whether there will be any interference with the electrical work. If the Electrical Subcontractor fails to check with the Mechanical Contractor and the electrical work is later found to interfere with the work of other subcontractors, then he shall make necessary changes, without additional cost to the Owner, to eliminate such interference.

1.1.6 Intent of Design: This performance specification is not intended to indicate and specify each component required, but does require that the components and materials be provided for a complete and operational installation.

1.1.7 Discrepancies in Documents: Each bidder shall be responsible for examining the specifications carefully before submitting his bid, with particular attention to errors, omissions, conflicts with provisions of laws and codes imposed by authorities having jurisdiction, conflicts between portions of specifications, and ambiguous definition of the extent of coverage in the contract. Any such discrepancy discovered shall be brought to the immediate attention of the Engineer for correction. Should any of the aforementioned errors, omissions, conflicts or ambiguities exist in the specification, the Electrical Subcontractor shall have the same explained and adjusted in writing before signing the contract or proceeding with work. Failure to notify the Engineer in writing of such irregularities prior to signing the Contract will cause the Engineer's interpretation of the Contract Documents to be final. No additional compensation will be approved because of discrepancies thus resolved.

## 1.2 APPLICABLE CODES AND STANDARDS

1.2.1 Work: All work shall be in accordance with the laws, rules, codes, and regulations set forth by Local, State, and Federal authorities having jurisdiction. All products and materials shall be manufactured, installed and tested as specified, but not limited to the latest accepted edition of the following codes, standards and regulations:

| | |
|---|---|
| NFPA | National Fire Protection Association |
| OSHA | Occupational Safety and Health Act |
| NEC | National Electrical Code (NFPA 70) – 2017 |
| UL | Underwriters Laboratory |
| NESC | National Electrical Safety Code |
| FM | Factory Mutual Association |
| IBC | International Building Code |
| IECC | International Energy Conservation Code - 2009 |
| Local AHJ | Local and State building, electrical, fire and health department and public safety codes agencies. |

1.2.2 Code Conflicts: When requirements cited in this Paragraph conflict with each other or with Contract Documents, the most stringent requirements shall govern conduct of work. The Engineer may relax this requirement when such relaxation does not violate the ruling of authorities that have jurisdiction. Approval for such relaxation shall be obtained in writing. Should the Electrical Subcontractor perform any work that does not comply with the requirements of the applicable building codes, state laws, and industry standards, he shall bear all costs arising in correcting these deficiencies.

# PART 2 – SCOPE OF WORK

## 2.1 GENERAL REQUIREMENTS

2.1.1 General Scope: The work to be accomplished under this section includes providing all labor, materials, equipment, consumable items, supervision, administrative tasks, tests and documentation required to install complete and fully operational electrical systems as described.

2.1.2 Administrative Responsibilities: The Electrical Subcontractor shall file plans, obtain permits and licenses, pay fees and obtain necessary inspections and approvals from authorities that have jurisdiction, as required to perform work in accordance with all legal requirements.

## 2.2 WORK TO BE PROVIDED UNDER THIS DIVISION

2.2.1 General Scope: The Work shall be complete from point of service to each outlet or device with all accessory construction and materials required to make each item of equipment or system complete and ready for operation. The work shall include but not be limited to the following. The Electrical Subcontractor shall provide:

A. **Feeder and Branch Circuit Wiring:** Provide feeder and branch circuits and devices for power to equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.
B. **Motor Circuit Wiring:** Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.

C. **Supports and Fittings:** Provide all support material and hardware for raceway, cable tray and electrical equipment.
D. **Terminations:** Provide terminations of all cable and wire unless otherwise noted.
E. **Penetrations:** Provide all building wall, floor and roof penetrations for raceway and cable tray where not provided by the General Contractor.

## 2.3 SHOP DRAWINGS

2.3.1 General Requirements: After the Contract is awarded, but prior to proceeding with the Work, the Electrical Subcontractor shall obtain complete shop drawings, product data and samples from manufacturers, suppliers, vendors, and Subcontractors for all materials and equipment specified herein, and submit data and details of such materials and equipment for review by the Engineer. Submission of such items shall follow the guidelines set in the General Section of the Specification Document. Prior to submission of the shop drawings, product data and samples to the Engineer, the Electrical Subcontractor shall review and certify that the shop drawings, product data and samples are in compliance with the Contract Documents. Further, the Electrical Subcontractor shall check all materials and equipment after their arrival on the jobsite and verify their compliance with the Contract Documents. A minimum period of ten working days, exclusive of transmittal time will be required in the Engineer's office each time shop drawings, product data and/or samples are submitted or resubmitted for review. This time period shall be considered by the Electrical Subcontractor when scheduling his Work.

2.3.2 Information to be included in Submittal: The shop drawing submittal shall include all data necessary for interpretation as well as manufacturer's name and catalog number. Sizes, capacities, colors, etc., specified on the drawings shall be specifically noted or marked on the shop drawings.

2.3.3 Responsibility of Submitted Equipment: The Engineer's review of such drawings shall not relieve the Subcontractor of responsibility for deviations from the Contract Specifications, unless he has in writing called the attention of the Engineer to such deviations at the time of the submission. The Engineer's review shall not relieve the Electrical Subcontractor from responsibility for errors or omissions in such drawings.

2.3.4 Proposal of Other Equipment: If the Electrical Subcontractor proposes an item of equipment other than that specified which requires any redesign of the wiring or any other part of the mechanical, electrical or architectural layout, the required changes shall be made at the expense of the trade furnishing the changed equipment at no cost to the Owner.

2.3.5 Substitution of Equipment of Equal Quality: Manufacturer's names are listed herein and on the drawings to establish a standard for quality and design. Where one manufacturer's name is mentioned, products of other manufacturers will be acceptable if, in the opinion of the Engineer the substitute material is of quality equal to or better than that of the material specified. Where two or more manufacturer's names are specified, material shall be by one of the named manufacturers only.

## 2.4 RECORD DRAWINGS

2.4.1 General Requirements: As work progresses, and for duration of the Contract, the Electrical Subcontractor shall maintain a complete and separate set of prints of Contract Drawings at job site at all times and record work completed and all changes from original Contract. Drawings shall clearly and accurately include work installed as a modification or added to the original design. At completion of work and prior to final request for payment, the Electrical Subcontractor shall submit a complete set of reproducible record drawings showing all systems as actually installed.

## 2.5 EQUIPMENT SPECIFICATIONS

2.5.1 Grounding System:

A. New equipment shall be bonded to the existing grounding electrode system. Furnish bonding jumpers, equipment grounding conductors, connections and other materials as may be required

for a complete installation. The completed system provided shall meet the requirements of the National Electrical Code and the interpretation of the Local Authority Having Jurisdiction.

B. Insulated grounding conductors shall be stranded copper with Type TW, THW or THHN/THWN insulation. Grounding conductor shall be provided with green insulation for identification purposes.

C. Equipment Grounding System: A separate, insulated copper conductor, with green colored insulation, shall be provided in all raceways and with every feeder, branch and control circuit, in addition to the grounded metallic conduit system. The equipment grounding conductor shall be grounded at both ends. Care shall be taken not to create a parallel path to the neutral conductor by any other means of grounding.

D. Grounding of Raceways: All metallic raceways shall be electrically continuous and bonded to the grounding system. All junction boxes, pull boxes, switch boxes, outlet boxes, etc., shall be bonded to the equipment grounding conductor by means of a green bonding jumper and screw. All devices (switches/receptacles etc.) having a grounding terminal shall have a bonding jumper installed tied directly to the equipment grounding conductor. (No exceptions).

2.5.2 Feeder and Branch Circuit Wiring:

A. Provide feeder and branch circuits and devices for power to equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.

B. All circuits feeding panels, circuit feeders and circuit wiring shall be copper, minimum size #12 AWG. Conductors shall be 600V rated with THHN/THWN insulation.

C. Flexible metal conduit shall be used for connections to vibrating equipment.

D. All conduits or penetrations in fire rated walls shall be furnished with fire stopping material to maintain the integrity of the rating.

**PART3 – EXECUTION**

**3.1 WIRING METHOD**

3.1.1 Requirements: Unless otherwise noted all wiring shall be installed in raceway as follows:

A. Power Distribution Indoors: Unless otherwise noted, all other power distribution wiring including feeders and branch circuits shall be installed in electrical metallic tubing (EMT) when installed exposed. Where exposed to potential physical damage, conduits shall be rigid steel, rigid aluminum or intermediate metal conduit. MC cable may be used above ceilings and in walls. Type NM cable (Romex) shall not be allowed.

B. Control Wiring: Shall be installed in EMT where exposed and on J-hooks above acoustic ceilings.

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**END OF SECTION 23 10 00**

CITY OF AUBURN, MAINE

CITY HALL

CHILLER REPLACEMENT PROJECT

60 Court Street, Auburn, Maine

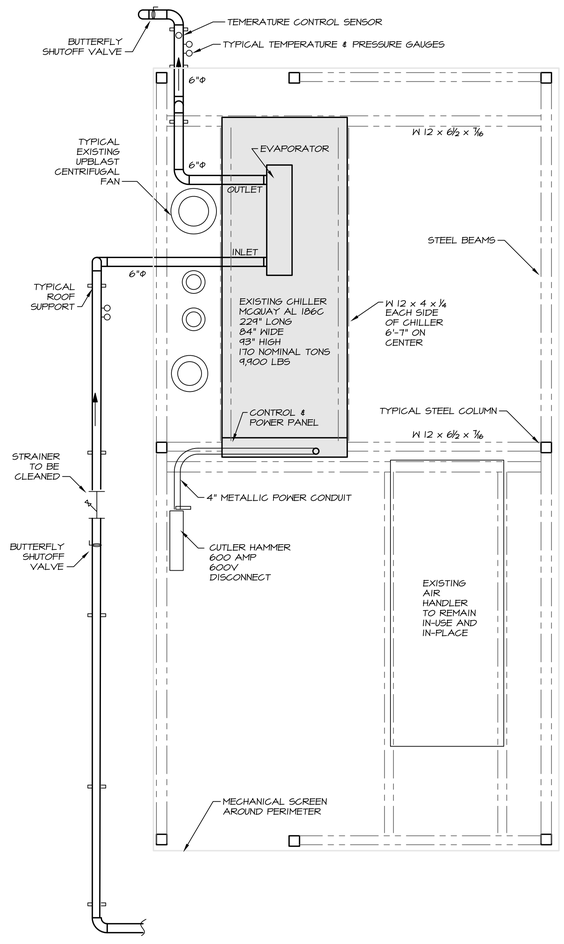
Bid No. 2018-001

Bid Documents

July 5, 2017

APPENDIX B

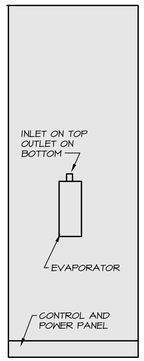
CONSTRUCTION DRAWINGS




1 DIAGRAMATIC PLAN VIEW OF EXISTING CONDITIONS

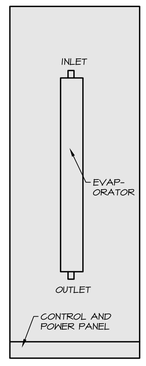
SCALE: 1/4" = 1'-0"

N




2 DAIKIN SCROLL C-1

SCALE: 1/4" = 1'-0"




3 TRANE SCREW C-1

SCALE: 1/4" = 1'-0"

## GENERAL NOTES

1. All systems are to be to meet the following Codes and Standards.
   - 1.1. ASHRAE 90.1 2007 - Energy Standard for Commercial Buildings.
   - 1.2. ASHRAE 60.1 2007 - Standard for Indoor Air Quality in Commercial Buildings.
   - 1.3. 2009 IECC - International Energy Conservation Code.
   - 1.4. NFPA - National Fire Protection Association Standards.
2. Do not cut any structural members with out pre-approval of structural engineer.

## CHILLER CONTROL NOTES

1. All control wiring is to be the responsibility of the Mechanical Contractor. All controls and control wiring to be subcontracted to Siemens Control Company (or Company authorized by Siemens Control Company).
2. All exposed control wiring to be run in EMT.
3. Sequence of Control.
   - 3.1. New Chiller to have the same sequence of control, monitoring and alarming as the existing Chiller. Reconnect and test.
   - 3.2. New chiller to have a BACnet comminication card provided by the equipment manufacturer.

## POWER WIRING NOTES

1. Power electrical wiring is the responsibility of the Mechanical Contractor. Mechanical Contractor to subcontract this work to a licensed Electrical Contractor.
2. All new electrical wiring to meet the requirements of NFPA 70.
3. The existing Disconnect can be reused in-place and the existing 4" metallic conduit can be reused. Note-power entrance location will be close to the existing; however each Manufacturer is different and it is very likely that additional conduit and new power wiring will be required from the Disconnect to the Chiller Power Connections.
4. Electrical Work required includes but is not limited to:
   - 4.1. Disconnect power from the existing Chiller Reconnect power to the new Chiller including all wiring and conduit.
   - 4.2. Replace the existing fuses in the Disconnect with the MOP (Maximum Overload Protection) recommended by the manufacturer of the Chiller. Fuses are to be replaced even if the current fuse size is correct.
   - 4.3. Replace power wiring from disconnect to chiller with 3-#500 KCM CU and #3 Ground

## ANTIFREEZE NOTE

1. Recharge piping and chiller with 20% Propylene Glycol Mixture.

## RIGGING NOTES

1. Removal of the existing Chiller and rigging of the new Chiller is the responsibility of the Mechanical Contractor.
2. The removal and rigging will require coordination with the Auburn Facilities Department. Traffic may need to be detoured and the City of Auburn will have limitations and final approval of dates and times for the crane activities. Be prepared for limitations on hours and days the City of Auburn will approve crane activities.
3. Remove Chiller from the jobsite as well as any unused materials. Dispose or recycle refrigerant per EPA Standards.

## PIPING NOTES

1. Reconnect new chiller piping. All new piping to be 6".
2. The point of reconnection to the existing piping will vary by option and manufacturer. Contractor to determine connection relocation points to existing piping.
3. All new chilled water piping to be Schedule 40 Steel.
4. All new connections to be welded or grooved pipe with Victaulic couplings.
5. All new piping to be insulated with 2" Fiberglass with corrogated aluminum covering with Zeston fitting covers. All joints to be caulked water tight.
6. The design intention is to match the existing piping and insulation material.

## CHILLER PLACEMENT NOTES

1. The new Chiller will be approximately 4" wider and 8" longer than the existing chiller (depending on Manufacturer).
2. Pre measurement and marking location on steel with be required before rigging.
3. Note the following limitations
   - 3.1. The Chiller cannot contact the existing exhaust fans.
   - 3.2. The adjacent air handler has a service door that swings open. Space must be allowed to let this service door swing open without modification.
   - 3.3. It is possible that some of the acceptable manufacturers will require that the power entrance is on the right side of the power panel (instead of the bottom). The power conduit will need to be coordinated to avoid the air handler service door swing and the supporting steel below.

## OWNER OPTION C

1. Supply and deliver to a storage location in Auburn (designated by the Owner) for future installation by the Owner the following Crane/Weinman pump with the following specification:
   - 1.1. Part Number 116117
   - 1.2. Model Number 4K4A-300P
   - 1.3. 690 gpm @ 12" head
2. Blake Equipment is the local representative of Crane/Weinman.

## REPLACEMENT CHILLER MINIMUM & MAXIMUM CRITERA

| TAG | ACCEPTABLE MANUFACTURERS | MINIMUM NET CAPACITY WITH 20% PROPYLENE GLYCOL AND 95 DEG. AMBIENT | MAXIMUM WIDTH | MAXIMUM LENGTH | MAXIMUM WEIGHT | EWT | LWT | GPM | MAX. WATER PRESSURE DROP IN FT | ELECTRIC | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | POWER | MAXIMUM CIRCUIT AMPACITY | |
| C-1 | DAIKIN, TRANE, YORK | 165 TONS | 84" | 240" | 14,000 LBS | 55 | 45 | 413 | 45 | 460/60/3 | 370 | BECAUSE OF EXISTING SUPPORTING STEEL, POWER WIRING AND SPACE AVAILABLE C-1 MUST NOT EXCEED MAXIMUMS & MINIMUMS LISTED |

## REPLACEMENT CHILLER WITH TWO SCREW COMPRESSORS – OWNER OPTION A

| TAG | BASIS-OF-DESIGN MANUFACTURER AND MODEL NUMBER | NET CAPACITY WITH 20% PROPYLENE | EER | WIDTH | LENGTH | WEIGHT | EWT | LWT | GPM | WATER PRESSURE DROP IN FT | ELECTRIC | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | POWER | MINIMUM CIRCUIT AMPACITY | MAXIMUM OVERLOAD PROTECTION | |
| C-1 | TRANE RTAC170 | 174.1 TONS | 10.9 | 84" | 232" | 12,585 LBS | 55 | 45 | 431 | 44.84 | 460/60/3 | 352 AMPS | 450 AMPS | WITH FACTORY INSTALLED FLOW SWITCH, ELASTOMETIC ISOLATORS & PROTECTIVE LOUVERS |

## REPLACEMENT CHILLER WITH MULTIPLE SCROLL COMPRESSORS – OWNER OPTION B

| TAG | BASIS-OF-DESIGN MANUFACTURER AND MODEL NUMBER | NET CAPACITY WITH 20% PROPYLENE | EER | WIDTH | LENGTH | WEIGHT | EWT | LWT | GPM | WATER PRESSURE DROP IN FT | ELECTRIC | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | POWER | MINIMUM CIRCUIT AMPACITY | MAXIMUM OVERLOAD PROTECTION | |
| C-1 | DAIKIN AGZ180E | 176.3 | 9.7 | 88" | 237" | 8,060 LBS | 55 | 45 | 434 | 16.2 | 460/60/3 | 393 AMPS | 450 AMPS | WITH FACTORY INSTALLED FLOW SWITCH, ELASTOMETIC ISOLATORS & PROTECTIVE LOUVERS |

Project:

CITY HALL
CHILLER REPLACEMENT PROJECT
60 Court St., Auburn, Maine 04210
Bid No. 2018-001

Client:

City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

STATE OF MAINE — Kurt F. Magnusson 10257 — PROFESSIONAL ENGINEER

Consultant Name and Address:

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT #108
10 FOREST FALLS DRIVE
YARMOUTH, MAINE 04096
(207) 846-1441

Firm Name and Address:

CORDJIA
CAPITAL PROJECTS GROUP
Camden, ME | Portland, ME | York, ME
207.236.9970 | www.cordjiacapitalprojects.com

Drawing Status:

- ☐ CONCEPT DESIGN
- ☐ 30% DESIGN DEVELOPMENT
- ☐ 60% DESIGN DEVELOPMENT
- ☐ 90% DESIGN DEVELOPMENT
- ■ 100% BID DOCUMENT
- ☐ 100% CONSTRUCTION DOCUMENT
- ☐ RECORD DOCUMENT

NO DRAWING SHALL BE RECOGNIZED AS A CONSTRUCTION DOCUMENT UNLESS IT BEARS A SIGNED REGISTRATION SEAL

Sheet Title:

MECHANICAL
PLAN, SCHEDULES, NOTES

| No. | Revision/Issue | Date |
|---|---|---|
| | | |
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Design by: KFM
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