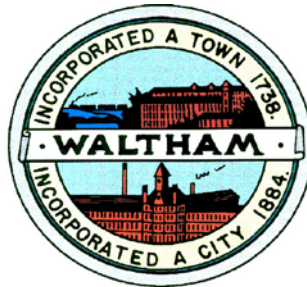


The City of Waltham



**Invites
Interested Parties
To propose the best offer and or bid
For the service or product herewith described:**

**Veterans Memorial Ice Rink,
Mechanical Improvements
(295 Totten Pond Road, Waltham)**

Bid Opening for GCs: 10:00 AM Wednesday October 25, 2017,

**Bid Opening for Filed Sub-Bids: 10:00 AM Tuesday October 17, 2017
(HVAC & Electric)**

**Last day for written questions: 12 Noon Thursday October 12, 2017.
(Via email ONLY to jpudulla@city.waltma.ma.us)**

**A pre-bid conference : 2:00 PM on Wednesday October 11, 2017
(Meet on site at 295 Totten Pond Rd, Waltham, MA 02452)**

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**SECTION 000020
NOTICE TO BIDDERS**

**Veterans Memorial Ice Rink, Mechanical Upgrades
295 Totten Pond Rd.
WALTHAM, MASSACHUSETTS**

The City of Waltham, Massachusetts invites sealed bids from Contractors for the **Veterans Memorial Ice Rink, Mechanical Upgrades, 295 Totten Pond Rd. Waltham, Massachusetts.**

PLANS, SPECIFICATIONS and other Contract Documents may be obtained by visiting the City's Web Site at www.city.waltham.ma.us/open-bids

Copies of Addenda will be e- mailed to the registered Bidders without charge. Addenda will also be posted on the web site above

Sealed **GENERAL BIDS** for this project will be accepted from eligible bidders at the Purchasing Department, Waltham City Hall, 610 Main Street, Waltham, MA 02452 until **10:00 AM October 25, 2017**, at which place and time they shall be publicly opened, read aloud and recorded for presentation to the Awarding Authority.

Sealed **FILED SUB BIDS** for **HVAC and Electric** trades will be accepted from eligible bidders at the Purchasing Department, Waltham City Hall, 610 Main Street, Waltham, MA 02452 until **10:00 AM on October 17, 2017**, at which place and time they shall be publicly opened, read aloud and recorded for presentation to the Awarding Authority.

A **PRE-BID CONFERENCE AND SITE INSPECTION** will be held for all interested parties at **2:00 PM on October 11, 2017** at the site of the **Veterans Memorial Ice Rink, Mechanical Upgrades, 295 Totten Pond Rd., Waltham, MA**

Attendance at this pre-bid conference is strongly recommended but not mandatory for parties submitting a bid. It will be the only opportunity to visit the site prior to the bid opening.

LAST DAY FOR WRITTEN QUESTIONS is at 12 noon October 12, 2017. Questions are to be sent via e-mail only to Jpedulla@city.waltham.ma.us

DCAMM Certification and Updated Statement are required for General Contractors and Filed Sub Bidders

Each general bid shall be accompanied by a bid deposit in the form of a bid bond, certified check, or a treasurer's or cashier's check issued by a responsible bank or trust company, payable to the City of Waltham in the amount of five percent (5%) of the value of the bid

Bids shall be made on the basis of the Minimum Wage Rates as determined by the Commissioner of Labor and Industries, Pursuant to the Provisions of Chapter 149, Sections 26 to 27D inclusive of Massachusetts General Laws, a copy of which is found in the City's Web site at www.city.waltham.ma.us/open-bids .

Veterans Memorial Ice Rink, Mechanical Upgrades

Bidders' selection procedures and contract award shall be in conformity with the rules of Commonwealth of Massachusetts statute Chapter 149 §44A-44M

Performance and Labor and Materials payment bonds in the full amount of the contract price will be required from the successful bidder.

The Awarding Authority reserves the right to reject any or all general bids, if it be in the public interest to do so, and to reject any sub-bid on any sub-trade if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the work as specified or that less than three such sub-bids were received and that the prices are not reasonable for acceptance without further competition.

The successful bidder will be required to furnish a Certificate of Insurance, naming the City of Waltham as an Additional Named Insured with a waiver of subrogation, for General Liability and Vehicle Liability in the amount of \$1,000,000 per occurrence and \$1,000,000 in the aggregate and Worker's Compensation Insurance as prescribed by law.

In accordance with the laws of the Commonwealth of Massachusetts the undersigned certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

CITY OF WALTHAM

Joseph Pedulla, CPO
Purchasing Department
City Hall, 610 Main Street
Waltham, MA 02452

Veterans Memorial Ice Rink, Mechanical Upgrades

SECTION 000025 INSTRUCTION TO BIDDERS

PART 1 - GENERAL

1.01 SCHEDULE OF DATES

- A. Advertisement appears in Central Register, Plans and Specifications ready for Bidders at the Offices of the Waltham Purchasing Agent after 4:30 P.M. on January 14, 2015. **Pre-**
- B. **bid walkthrough and site inspection: October 11, 2017 at 2:00 PM.** Meet at **295 Totten Pond Rd, Waltham.**
- C. **Questions** and requests for interpretations may be submitted in writing via e-mail ONLY to Jpedulla@city.waltham.ma.us up to **12:00 noon October 12, 2017.**
- D. Addenda will be issued with interpretations as determined by the Purchasing Department only via e-mail and posting on the web site.
- E. **General Bids Deadline: 10:00 A.M. October 25, 2017,** in the Purchasing Department, City Hall, 610 Main Street, Waltham, MA 02452, Attn: J. Pedulla, CPO, where the bids will be publicly open and read.

1.02 BIDDING PROCEDURE

- A. Bids for the work are subject to the provisions of General Laws, Chapter 30, § 39M, as amended. Regulations governing the bidding procedures as set forth in the above mentioned amended General Laws must be followed.
- B. In the event of any inconsistencies between any of the provisions of these Contract Documents and of the cited statute, anything herein to the contrary notwithstanding, the provisions of the said statute shall control.
- C. No General Bid received by the Awarding Authority after the time respectively established herein for the opening of General Bids will be considered, regardless of the cause for the delay in the receipt of any such bid.

1.03 WITHDRAWAL OF BIDS

- A. Bids may be withdrawn prior to the time respectively established for the opening of General Bids only on written request to the Awarding Authority.

1.04 INTERPRETATION OF CONTRACT DOCUMENTS

- A. No oral interpretation will be made to any bidder. All questions or requests for interpretations must be made in writing to the Architect.

Veterans Memorial Ice Rink, Mechanical Upgrades

- B. Every interpretation made to a bidder will be in the form of an Addendum to the drawings and/or specifications, which will be made available to all persons to whom Contract Documents have been issued.
- C. Failure of the Awarding Authority to send, or of any bidder to receive any such Addendum shall not relieve any bidder from obligation under his bid as submitted.
- D. All such Addenda shall become a part of the Contract Documents.

1.05 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- A. Each bidder may visit the site at the established time of the pre-bid meeting and site inspection. No independent visits are permitted as the Waltham Cultural Center conducts regular classes with school children and any unauthorized visit may interfere with the educational programming.
- B. By submitting a bid, the bidder agrees that the Contract Documents are adequate and that the required result for a full and complete installation can be produced. The successful bidder shall furnish any and all labor, materials, insurance, permits and all other items needed to produce the required result to the satisfaction of the Awarding Authority.

1.06 BID SECURITY

- A. The General Contractor's bid must be accompanied by bid security in the amount of five percent (5%) of the bid.
- B. At the option of the bidder, the security may be bid bond, certified, treasurer's or cashier's check issued by a responsible bank or trust company. No other type of bid security is acceptable.

Bid Bonds shall be issued by a Surety Company qualified to do business under the laws of the Commonwealth of Massachusetts.

- C. Certified, Treasurer's or Cashier's check shall be made payable to the City of Waltham, Massachusetts.
- D. The bid security shall secure the execution of the Contract and the furnishing of a Performance and Payment Bond by the successful General Bidder for 100% of the contract value.
- E. Should any General Bidder to whom an award is made fail to enter into a contract therefore within five (5) days, Saturdays, Sundays and Legal Holidays, excluded, after notice of award has been mailed to him or fail within such time to furnish a Performance Bond and also a Labor and Materials or Payment Bond as required, the amount so received from such General Bidder through his Bid Bond, Certified, Treasurer's or Cashier's check as bid deposit shall become the property of the City of

Veterans Memorial Ice Rink, Mechanical Upgrades

Waltham, Massachusetts as liquidated damages; provided that the amount of the bid deposit, which becomes the property of the City of Waltham, Massachusetts, shall not in any event exceed the difference between his bid price and the bid price of the next lowest responsible and eligible bidder; and provided further that, in case of death, disability, bona fide clerical error or mechanical error of a substantial nature, or other unforeseen circumstances affecting the General Bidder, his deposit shall be returned to him.

1.07 BID FORM

- A. General Bids shall be submitted on the "FORM FOR GENERAL BID" enclosed. Erasures or other changes must be explained or noted over the signature of the bidder.
- B. Bid forms must be completely filled in. Bids which are incomplete, conditional, or obscure, or which contain additions not called for will be rejected.
- C. General Bidders shall submit one set of executed bid forms to the Awarding Authority.

1.08 SUBMISSION OF BIDS AND BID SECURITIES

- A. Each bid submitted by a General Contractor shall be enclosed in a sealed envelope that shall be placed with the bid security in an outer envelope. The outer envelope shall be sealed and clearly marked as follows:

(Firm Name): _____
General Bid and Bid Security for:
Veterans Memorial Ice Rink, Mechanical Upgrades

1.09 AWARD OF CONTRACT

- A. The Contract shall be awarded to the lowest responsible and eligible General Bidder on the basis of competitive bids in accordance with the procedure set forth in the provision of Chapter 30, §39M of the General Laws of the Commonwealth of Massachusetts.
- B. If the bidder selected as the General Contractor fails to perform his agreement to execute a contract in accordance with the terms of his General Bid, and furnish a Performance Bond and also a Labor and Materials or Payment Bond, as stated in his General Bid an award shall be made to the next lowest responsible and eligible bidder.
- C. The words "lowest responsible and eligible bidder" shall be the bidder whose name is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work and who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed, or to be employed, on the work. Essential information in regard to such qualifications shall be submitted in such form as the Awarding Authority may require.

Veterans Memorial Ice Rink, Mechanical Upgrades

- D. Action on the award will be taken within sixty (60) days, Saturdays, Sundays and Legal Holidays excluded after the opening of the bids.

1.10 SECURITY FOR FAITHFUL PERFORMANCE

- A. The successful bidder must deliver to the Awarding Authority simultaneously with his delivery of the executed contract, an executed Performance Bond, and also a Labor and materials or Payment Bond, each issued by a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority and each in the sum of One Hundred Percent (100%) of the Contract Price, as surety for the faithful performance of his contract, and for the payment of all persons performing labor or furnishing materials in connection therewith. Said bonds shall provide that, if the General Contractor fails or refuses to complete the Contract, the Surety Company will be obligated to do so.
- B. Premiums are to be paid by the General Contractor, and are to be included in the Contract Price.

1.11 EQUAL OPPORTUNITY

- A. The City of Waltham is an Equal Opportunity employer and will require compliance with the minority business enterprise plan (MBE) on file in the Purchasing Department

1.12 PRE-BID WALK-THRU

A.A pre-bid conference will be held at the site on **October 11, 2017 at 2:00 PM** at the **Veteran Memorial Ice Rink, Mechanical Upgrades**. Interested parties are encouraged to attend given that this will be the only time the site is available prior to the submission of bids. Further, prior to the bid opening, potential bidders may not go onto the site any time other than the aforementioned pre-bid conference.

1.13 SITE VISITS

- A. Prospective bidders are prohibited from going onto the site prior to the Bid Opening or any time other than the pre-bid walk-thru, as set forth in Section 1.12 above, unless authorized by the Architect in an Addendum to the bid documents.

1.14 CONTRACT DOCUMENTS

- A. The Awarding Authority shall make available the bid documents and addenda in the City Web site at www.city.waltham.ma.us/open-bids. No plans will be mailed.

1.15 EQUALITY

- A. Except where otherwise specifically provided to the contrary, the words “or approved equal” are hereby inserted immediately following the name or description of each article, assembly, system, or any component part thereof in the Contract Documents. It

Veterans Memorial Ice Rink, Mechanical Upgrades

is the Contractor's responsibility to provide all the research and documentation that would prove a product or assembly is "equal". Failure to provide research or documentation does not alleviate the Contractor's responsibility to meet the schedule.

1.16 TAX FREE NUMBER

- A. The City of Waltham has a tax-free number.

1.17 SCHEDULE

- A. The work of the Contract shall be Fully Completed in **90 calendar days** after the date of the Notice-to-Proceed. **However, work shall not begin until April 15, 2018**

1.18 GENERAL CONDITIONS CHARGES.

General Condition charged to the Payment application for AIA 702 shall be spread over a period of 7 months or 7 Payment application cycles whichever is later

1.19 WEEKLY JOB MEETINGS

- A. There will be a weekly job meeting at the site on the same agreed-upon day and time. Time will be provided to discuss and view the progress of the work and to answer questions. The Contractor's job Superintendent and Project Manager shall attend each meeting. The City reserves the right to have job meetings conducted in the location of its choosing.

1.20 PROJECT SUPERINTENDENT

- A. The Contractor shall provide the same person as Superintendent for the entire duration of the project. Failure to maintain the same person in this position shall result in a One Thousand Dollar (\$1,000.00) penalty per incident which shall cover the Architect's time to re-orient new personnel.

1.21 AWARD

- A. The Awarding Authority reserves the right to reject any or all bids if it be in the public interest to do so, and to act upon the bids and make its award in any lawful manner.

1.22 PREVAILING WAGE SCHEDULE

- A. Bids shall be made on the basis of the Prevailing Wage Schedule, as determined by the Federal Government and the Commissioner of Labor and Industries, pursuant to the provision of the Massachusetts General Laws. The Prevailing Wage Schedules for this project can be found in the City's web Site at www.city.waltham.ma.us/open-bids

Veterans Memorial Ice Rink, Mechanical Upgrades

1.23 CONFLICT OF INTEREST

- A. A bidder filing a proposal thereby certifies that the proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder for the same work, and that the bidder is competing solely on its own behalf without connection with, or obligation to, any undisclosed person or firm.

1.24 PROCEED ORDERS

- A. No bidder is to proceed without a proceed order as set out in the contract.

1.25 INTENTIONALLY LEFT BLANK

1.26 COMPLIANCE WITH MASSACHUSETTS GENERAL LAWS

- A. Pursuant to Massachusetts General Laws, Chapter 62C, Section 49A, I certify under the penalty of perjury that I, to the best of my knowledge and belief have filed all state tax returns and paid all the state taxes required under law.

1.27 CONSTRUCTION BARRICADES

- A. The General Contractor shall provide all barricades to enclose the work area to prevent unauthorized access to the site.
 - 1. The barricades shall provide enough room for all construction activities to be performed while separated from pedestrians, students, and staff on site.
 - 2. Safety is the sole responsibility of the Contractor and any barricades necessary to protect the work and the public shall be provided.
 - 3. Provide entrance protection.

1.28 INSURANCE

- A. The contractor shall purchase and maintain, at his expense all insurance required by the Contract. Documents and all insurance required by the applicable laws of Massachusetts, including but not limited to, General Laws, Chapter 146, in connection with all hoisting equipment.
- B. The Contractor shall purchase and maintain such insurance as will protect him from claims under workmen's compensation acts and from claims for damages because of bodily injury, including death and all property damage including, without limitation, damage to buildings and adjoining the site of construction which might arise from and during operations under this contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them including:
 - 1. Statutory Worker's Compensation and Employer's Liability

Veterans Memorial Ice Rink, Mechanical Upgrades

The contractor shall provide insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws (so-called Worker's Compensation Act) to all persons to be employed under this contract and shall continue in force such insurance as aforesaid shall be deemed a material breach of this Contract and shall operate as an immediate termination thereof. The contractor shall, without limiting the generality of the foregoing, conform to the provisions of Section 34A of Chapter 149 of the General Laws, which Section is incorporated herein by reference and made a part of hereof.

2. Comprehensive General Liability Insurance
Minimum bodily injury limits of \$ 1,000,000 per person and \$ 1,000,000 per accident, and property damage limits of \$ 500,000 per accident and \$ 1,000,000 aggregate during any 12 month period, shall include the following:
 - a. Public liability (bodily injury and property damage)
 - b. X.C.U. (explosion, collapse, and underground utilities)
 - c. Independent contractor's protective liability.
 - d. Products and completed operations.
 - e. Save harmless agreement for Owner and Architects set forth in ARTICLE 10.11 of the GENERAL CONDITIONS.
3. Comprehensive All Risk Motor Vehicle Liability Insurance
Minimum bodily injury limits of \$ 500,000 per person, \$ 1,000,000 per accident, and property damage limit of \$ 1,000,000 per accident.
4. All Risk Insurance
Covering all Contractors' equipment with a provision for Waiver of Subrogation against the Owner.
5. Excess Liability Insurance in Umbrella Form with combined Bodily Injury and Property Damage Limit of \$ 1,000,000.
6. **City of Waltham shall be a Named Additional Insured for General Liability only with a Waiver of Subrogation on the insurance policy for this project.**

1.29 SITE ACCESS

- A. The General Contractor shall gain access to the site via routes approved by the Owner.
 1. The General Contractor as part of the bid price will restore all roads, curbs, driveways, walks and grassed or landscaped areas damaged during construction.

1.30 CONSTRUCTION TRAILER

- A. The General Contractor shall locate the construction trailer at locations approved by the Owner.
- B. The General Contractor shall locate all on site stored or staged materials within the enclosed area designated by the Owner.

SECTION 000025 – INSTRUCTION TO BIDDERS

Veterans Memorial Ice Rink, Mechanical Upgrades

1.31 INTENTIONALLY LEFT BLANK

1.32 COMPLETE BID FORMS

- A. Please Note: Each bidder must fill in all the blanks on all the bid forms, even if the information is “zero dollars” or “not applicable”. Also, please acknowledge all Addenda issued by the Awarding Authority

2.00 FUNDS APPROPRIATION and LOAN AUTHORIZATION.

- A THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

3.0 CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.

- A All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor

Signature of Individual or Corporate Name

By:

(Signature of Corporate Officer if applicable)

Title:_____

Social Security Number or Federal Identification Number: _____

END OF SECTION

FORM 000091

COMPLIANCE FORMS

(PLEASE COMPLETE AND SUBMIT THESE FORMS WITH YOUR RESPONSE)

NON-COLLUSION FORM AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity or group of individuals. The undersigned certifies that no representations made by any City officials, employees, entity, or group of individuals other than the Purchasing Agent of the City of Waltham was relied upon in the making of this bid

_____, _____
(Signature of person signing bid or proposal)Date

(Name of business)

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, & 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

_____, _____
Signature of person submitting bid or proposal Date

Name of business

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

**WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE**

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided, A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract. In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of his or her weekly payroll records to the awarding authority. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. Once collected, the awarding authority is also required to preserve those reports for three years. In addition, each such contractor, subcontractor, or public body shall furnish to the awarding authority directly, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 201__

I _____,
(Name of signatory party) (Title)

I do hereby state that I pay or supervise the payment of the persons employed by

_____ On the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____, Title _____

Print _____, Date _____

DEBARMENT CERTIFICATION

In connection with this bid and all procurement transactions, by signature thereon, the respondent certifies that neither the company nor its principals are suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from the award of contracts, procurement or non procurement programs from the Commonwealth of Massachusetts, the US Federal Government and /or the City of Waltham. "Principals" means officers, directors, owners, partners and persons having primary interest, management or supervisory responsibilities with the business entity. Vendors shall provide immediate written notification to the Purchasing Agent of the City of Waltham at any time during the period of the contract or prior to the contract award if the vendor learns of any changed condition with regards to the debarment of the company or its officers. This certification is a material representation of fact upon which reliance will be placed when making the business award. If at any time it is determined that the vendor knowingly misrepresented this certification, in addition to other legal remedies available to the City of Waltham, the contract will be cancelled and the award revoked.

Company Name _____

Address _____

City _____, State _____, Zip Code _____

Phone Number (____) _____

E-Mail Address _____

Signed by Authorized Company Representative: _____

_____ Print name. Date _____

10 HOURS OSHA TRAINING CONFIRMATION

Chapter 306 of the Acts of 2004

CONSTRUCTION PROJECTS

AN ACT RELATIVE TO THE HEALTH AND SAFETY ON PUBLIC

The undersigned hereby certifies that all employees to be employed at a worksite for construction, reconstruction, alteration, remodeling, repair, installation, demolition, maintenance or repair of any public work or any public building estimated to cost more than \$10,000.00 have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first payroll report for each employee and will comply with all laws and regulations applicable to awards of subcontracts subject to section 44F.

Company Name: _____

Address: _____

Signature: _____

Title: _____

Print Name _____

Date _____

See following Chapter 306 of the Acts of 2004

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

COMPLETE ONLY IF YOUR COMPANY IS AN LLC

**CERTIFICATE OF AUTHORITY
LIMITED LIABILITY COMPANY**

The undersigned, being (a/the) duly elected, qualified and active (member / manager) of _____, a Massachusetts limited Liability Company (hereinafter “the Company”)

Does Hereby Certify that

1. The Articles of Organization of the Company were duly filed with the Office of the Secretary of State of the State of Massachusetts on _____, and the Articles of Organization have not been (further) amended.
2. The Company has complied with the publication requirements contained in Section 67 of the Limited Liability Company Law.
3. There exists an Operating Agreement of the Company and that the said Operating Agreement has not been amended or repealed and that the said Operating Agreement remains in full force and effect as of this date.
4. Neither the Articles of Organization nor the Operating Agreement (as amended) require any further act to be taken or a meeting to be held by its members other than as follows:
5. All said requirements, whether as contained in the Articles of Organization or in the Operating Agreement or by operation of law as to the transaction of _____, 20____ have been met.
6. The following person or persons has/have been duly authorized by the Company to execute all documents in connection with said transaction and that the signature appearing to the right of their name(s) is his/her genuine signature.

NAME	OFFICE HELD	SIGNATURE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

IN Witness Whereof, the undersigned has executed this Certificate of Authority this _____ day of _____, 20____.

(Signature)

STATE OF MASSACHUSETTS, COUNTY OF _____

On the ____ day of _____, 20____, before me, the undersigned personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/ they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public: _____

My Commission Expires: _____

Notary Stamp:

PROVIDE THREE (3) SERVICE APPROPRIATE REFERENCES

1. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

2. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

3. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

- F. The undersigned agrees that, if selected as general contractor, he will within five days, Saturdays, Sundays, and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price, provided, however, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

F Final Completion

1. The work of the Contract shall be completed in **Ninety (90) calendar days from the date of the Notice-to-Proceed (NTP). However, work shall not begin until April 15, 2018**

G. In accordance with M.G.L., the undersigned certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

Sincerely,

(Bidder)

(Address of Bidder)

By: _____
(Title - Owner*, Partner*)

(Seal, if Corporation)

By: _____
(If Corporation - Name and Office)

* If the business owned by the individual or partnership is conducted under a trade or assumed name, a certified copy of doing business under an assumed name should be annexed.

Date _____

(Name of Bidder)

By _____
(Title)

(Business Address)

END OF SECTION

**SECTION 001020
FORM FOR SUB-BID**

TO ALL GENERAL BIDDERS EXCEPT THOSE EXCLUDED:

- A. The undersigned proposes to furnish all labor and materials required for the project:

Veterans Memorial Ice Rink, Mechanical Upgrades
 295 Totten Pond Rd
 Waltham, MA 02451

In accordance with the documents prepared by:

Southgate Consulting
 85 Wester Avenue
 Essex, MA 01929

- B. This bid includes Addenda numbered _____, _____, _____, _____, _____, _____.

- C. The Proposed Contract Price is: Base \$ _____

Alternate #1 Air Conditioning: ADD \$ _____

GRAND TOTAL \$ _____

- D. This Sub-Bid may be used by any General Bidder EXCEPT:

This Sub-Bid may ONLY be used by the following General Bidders:

The undersigned agrees that, if selected as a sub-bidder, they will, within five days, Saturdays, Sundays and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such general bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the general contract, and, if requested to do so in the general bid by such general bidder, who shall pay the premiums therefor, furnish a performance and payment bond of a surety company qualified to do business under the laws of the Commonwealth and

satisfactory to the awarding authority, in the full sum of the subcontract price.

The names of all persons, firms and corporations furnishing to the undersigned labor or labor and materials for the class or classes or part thereof of work for which the provisions of the section of the specifications for this sub-trade require a listing in this paragraph, including the undersigned if customarily furnished by persons on his own payroll and in the absence of a contrary provision in the specification the name of each such class of work or part thereto and the bid price for such class of work or part thereof are:

NAME	CLASS OF WORK	BID PRICE
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____

The undersigned agrees that the above list of bids of the undersigned represents bona fide bids based on hereinbefore described plans, specifications and addenda, and that, if the undersigned is awarded the contract, they will be used for the work indicated at the amounts stated, if satisfactory to the awarding authority.

The undersigned further agrees to be bound to the general contractor by the terms of the hereinbefore described plans, specifications (including all general conditions stated therein) and addenda, and to assume toward him all the obligations and responsibilities that the contractor, by those documents, assumes toward the owner.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

The undersigned further certifies under penalty of perjury that this sub-bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated there under.

Date _____

(Name of Bidder)

By _____
(Title)

(Business Address)

(Signature)

END OF PROPOSAL FORM

Section 004343

Massachusetts State Wage Rates

The prevailing wage rates for this project are found at
www.city.waltham.ma.us/open-bids

SECTION 005000

AGREEMENT

CITY OF WALTHAM

ARTICLE 1. This agreement, made this _____ day of _____, 2017 by and between the CITY OF WALTHAM, party of the first part, hereinafter called the CITY, by its MAYOR, and

hereinafter called the CONTRACTOR.

ARTICLE 2. Witnesseth, that the parties to this agreement, each in consideration of the agreement on the part of the others herein contained, do hereby agree, the CITY OF WALTHAM for itself, and said contractor for his heirs, executors, administrators and assigns as follows:

To furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished (except as otherwise specified) and deliver in and about the project and to do and perform all work in strict conformity with the provisions of this Contract and of the Notice to Bidders, bid, Project Manual, and Drawings hereto annexed. The said Notice to Bidders, bid, Project Manual, and Drawings are hereby made a part of this contract as fully and to the same effect as if the same had been set forth at length and incorporated in the contracts.

ARTICLE 3. In consideration of the foregoing premises the CITY agrees to pay and the CONTRACTOR agrees to receive as full compensation for everything furnished and done by the CONTRACTOR under this contract, including all work required by not included in the items herein mentioned, and also for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, such prices as are set forth in the accompanying bid.

This Agreement entered into as of the day and year first written above.

**Section 005000
AGREEMENT**

CITY OF WALTHAM, MASSACHUSETTS

FOR THE CITY

Jeannette A. McCarthy, MAYOR,
City of Waltham
Date: _____

John Cervone, City Solicitor
Date: _____
APPROVED AS TO FORM ONLY

Nick Abruzzi, Recreation Director
Date: _____

Joseph Pedulla, Purchasing Agent
Date: _____

Paul Centofanti, Auditor
Date: _____

I CERTIFY THAT SUFFICIENT FUNDS
ARE AVAILABLE FOR THIS CONTRACT

FOR THE COMPANY

CONTRACTOR (Signature),
Date: _____

Company

Address

**Section 005000
AGREEMENT**

VETERANS MEMORIAL RINK, MECHANICAL UPGRADES

SECTION 00503

GENERAL CONDITIONS

1. INFORMATION

All information shall come from the Office of the City Purchasing Agent. The Contractor shall inquire at this office for any information needed. Wherever the words “or equal as approved” are used, it is to be understood that the opinion of the City Purchasing Agent shall govern.

2. SUITS

The Contractor shall assume defense of and shall indemnify and hold the City and its agents harmless from all suits and claims against the City and its sub-contractors arising from the use of any invention, patent right labor or employment, or from any act of omission or neglect of the City, its agents, employees or any subcontractor in performing the work, under this contract.

3. LAWS AND REGULATIONS

The Contractor shall conform to all the applicable rules, regulations, laws and ordinances of the City of Waltham, the Commonwealth of Massachusetts, the United States of America and all agencies having jurisdiction over this contract.

4. PROTECTION OF PROPERTY

The Contractor shall take all proper precautions to protect the City’s property from damage and unnecessary inconvenience. Any City property damaged by the Contractor in carrying out the provisions of this contract shall be restored to its original condition, by and at the expense of the Contractor.

5. PROTECTION OF PERSONS

The Contractor shall take all proper precautions to protect persons from injury, unnecessary inconvenience, and shall be responsible for his failure to do so. The Contractor agrees to hold the City harmless from any and all liabilities of every nature and description, which may be suffered through bodily injury, including death, to any person, by reason of negligence of the Contractor, his agents or employees, or any subcontractor.

6. INSURANCE

A. **WORKMAN’S COMPENSATION:** The Contractor shall provide by insurance for the payment of compensation and furnishing of other benefits under Chapter 152 of the General Laws of the Commonwealth of Massachusetts to all persons to be employed under this contract, the premiums for which shall be paid by the Contractor.

B. **COMPREHENSIVE GENERAL LIABILITY**

Bodily Injury:	\$1,000,000 Each Occurrence
	\$2,000,000 Aggregate
Property Damage:	\$1,000,000 Each Occurrence
	\$2,000,000 Aggregate

C. **AUTOMOBILE (VEHICLE) LIABILITY**

Bodily Injury	\$2,000,000 Each Occurrence
Property Damage	\$1,000,000 Aggregate

D. **UMBRELLA POLICY**

General liability	\$2,000,000
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Your bid response must include a Certificate of Insurance with the above limits as a minimum. In addition, the Certificate of Insurance must have the following text contained in the bottom left box of the Certificate: [“The City of Waltham is a Named Additional Insured for all Insurance”](#). The Certificate of Insurance must be mailed directly to:

SECTION 00503

GENERAL CONDITIONS

VETERANS MEMORIAL RINK, MECHANICAL UPGRADES

Office of the Purchasing Agent
Purchasing Department
City of Waltham
610 Main Street
Waltham, MA 02452

7. LABOR AND MATERIALS BOND

The Contractor agrees to execute and deliver to the City, a Performance Bond and a Labor and Materials Bond EACH equal to 100% of the contract value. This contract shall not be in force until said bond has been delivered and accepted by the City. Bond to be issued by a company licensed by the Commonwealth of Massachusetts.

8. PERSONNEL:

The Contractor shall employ a competent supervisor and all properly licensed personnel necessary to perform the services required in this contract. The City Purchasing Agent shall have the right to require the Contractor to remove and/or replace any of the personnel for nonperformance or for unprofessional behavior. The City Purchasing Agent may require the Contractor to submit a weekly performance record of the areas and of the work performed, on forms approved by the City Purchasing Agent. The Contractor or his supervisor shall be available to inspect such work as required by the City Purchasing Agent.

9. PREVAILING WAGES

The Contractor is required to pay the prevailing wages as determined by the Federal Government and by Chapter 149, Sections 26 and 27D of the Massachusetts General Laws, including the submission of weekly payrolls to the awarding authority. Copies of the Prevailing Wage Schedule is found on line at www.city.waltham.ma.us/open-bids

10. MATERIALS

The City or its Agent reserves the right to approve or reject any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any rejected supplies, materials or equipment, to the satisfaction of the City or its Agents.

11. TERMINATION OF CONTRACT

This contract may be terminated by the City upon deliverance to the Contractor of a five-day written notice of said termination.

12. CONTRACT OBLIGATIONS

Contract obligations on behalf of the City are subject to an annual appropriation to cover the contract obligation and shall be in force until the date of Final acceptance excluding any guarantee period.

13. BIDDER EXPERIENCE EVALUATION

Each bidder shall submit with his bid, all the information relative to their experience and qualifications in performing the work required under this contract and shall have been in business for a minimum of five (5) years, in order for their bid to be considered.

14. NOT-TO-EXCEED AMOUNT

The bid amount proposed in your company's response is a "not-to- Exceed" amount unless the City makes changes, in writing, to the scope of work to be performed. The Change Order must be signed and approved by the City's Purchasing Agent, City Auditor, Law Department and the Mayor prior to

VETERANS MEMORIAL RINK, MECHANICAL UPGRADES

the commencement of the change order work. No work is to begin until the proper approvals have been obtained. A change order will be priced at the unit price. Failure to comply with this procedure will result in the cancellation of the contract and the non-payment of services provided

16. FINANCIAL STATEMENTS.

The City may require, within five (5) days after the bid opening, a complete and detailed Financial Statement prepared by a Certified Public Account, to determine a bidder's financial stability.

17 BREACH OF CONTRACT/ NON PERFORMANCE

If the Contractor shall provide services in a manner, which is not to the satisfaction of the City, the City may request that the Contractor refurnish services at no additional cost to the City until approved by the City. If the Contractor shall fail to provide services, which are satisfactory to the City, the City in the alternative may make any reasonable purchase or Contract to purchase services in substitution for those due from the Contractor. The City may deduct the cost of any substitute Contract for nonperformance of services together with incidental and consequential damages from the Contract price and shall withhold such damages from sums due or to become due to the Contractor. If the damages sustained by the City exceed sums due or to become due, the Contractor shall pay the difference to the City upon demand. The Contractor shall not be liable for any damages sustained by the City due to the Contractor's failure to furnish services under the terms of this Contract if such failure is in fact caused by the occurrence of a contingency the nonoccurrence of which was a basic assumption under which this Contract was made, including a state of war, embargoes, expropriation of labor strike or any unanticipated federal, state or municipal governmental regulation of order, provided that the Contractor has notified the City in writing of such cause within seven (7) days after its occurrence.

18 RIGHT TO AUDIT

The City of Waltham has the right to review and audit documents related to this contract. This right extends to any subcontractor, supplier or other entity used by the prime contractor to fulfill the obligations under this contract.

19. CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

20. BID OPENING INCLEMENT WEATHER

If, at the time of the originally scheduled bid opening, City Hall is closed to inclement weather or another unforeseeable event, the bid opening will be extended until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

21 FUNDS APPROPRIATION.

THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

22 THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, OR ANY PART OF ANY BID, WHICH IN THE OPINION OF THE AWARDING AUTHORITY, IS IN THE BEST INTERESTS OF THE CITY OF WALTHAM.

Section 00610

PERFORMANCE BOND

CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location):

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Modifications to this Bond Form: None See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

_____ (seal)

_____ (seal)

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

By: _____

Signature

Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____

Attest: _____

Signature

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the

Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the

amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall

be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

Section 00615

PAYMENT BOND

CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location):

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Modifications to this Bond Form: None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

- 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
- 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and

- the basis for challenging any amounts that are disputed; and
- 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
 9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
 10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
 11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
 12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
 13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
 14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be

deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the

agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

**CITY OF WALTHAM. VETERAN'S MEMORIAL RINK.
MECHANICAL UPGRADES PROGRAM**

CONTRACT GENERAL REQUIREMENTS

A) Safety.

- a. Erect and maintain protective barriers and/or warnings around the active construction area. Limit activity and material storage to this enclosure. Exceptions will be permitted on a limited basis and must be scheduled with owner's project manager.
- b. Maintain access per phasing/traffic plan for emergency response vehicles and Owner requirements.
- c. GC is responsible for maintaining and enforcing its written safety program and those of its subcontractors. A copy of the GC's written safety program shall be maintained onsite at all times.
- d. MSDS shall be maintained and updated in a binder and kept onsite and available to all workers.
- e. Follow protocol on lock-out, tag-out of all electrical and mechanical systems

B) Housekeeping.

- a. Maintain an orderly work area at all times. Trash and debris to be removed from site or to a dumpster daily.
- b. All trash and debris to be kept out of public/non-work areas at all times
- c. Protect adjacent surfaces scheduled to remain.

C) Administration

a. Project supervision.

- i. Assign a qualified full time project superintendent who will:
 - 1. Schedule and oversee daily construction operations.
 - 2. Maintain comprehensive daily project reports to include:

- a. All subcontractors, their activities and employees
- b. Weather at start and end of each day
- c. All visitors to the site and the purpose of their visit.
- d. All materials received
- e. Schedule deviations and recovery plans.

2. Schedule all necessary inspections as/when needed. **Note:** City of Waltham will engage and pay for an independent testing firm. GC is to schedule same.

ii. Assign a project manager who will:

1. Conduct and record project meetings on a weekly basis.
2. Prepare (and update on a bi-weekly basis) a critical path type construction schedule in Gantt Chart format
3. Visit the project at least bi-weekly and interface with owner's representative as needed.
4. Prepare and transmit all required submittals to owner's representative for approval. Keep an active log and critical path accounting of same.
5. Prepare, on a monthly basis, applications for payment using AIA G702 and G703 or other approved format.
6. Maintain, and update as necessary, a comprehensive Construction documents list.

b. Reporting.

- i. Prepare and maintain daily job reports and photos, records of inspection, accounting, change order log, submittals log, in the field office accessible to owner

c. Meetings.

- i. Conduct weekly (minimum) construction progress meetings. Keep, author and distribute meeting minutes in a format acceptable to owner.

d. Quality Assurance

- i. City of Waltham will retain a certified testing agency for the purposes of structural connections. Cooperate with and schedule this agency as required

D) Project Close-out,

- a) Prepare and submit, in electronic or paper format at Owner's discretion, complete close-out documentaion to include:
 - i. As Built drawings detailing precise locations and relationships of all mechanical components.
 - ii. Operations and Maintenance manuals for all mechanical systems.
 - iii. Warranties on all systems and general waranty covering all work for one year from date of acceptance.
 - iii. Start up and training for designated owner personnel. A minimum of two sessions required.
 - iv. Provide complete valve tagging on all valves and identification signage on all piping. Numbered valve locations/functions to be identified on as-built drawings.
 - v. Photographic log of concealed items.

-submitted 06/21/2017. Southgate Consulting-

PROJECT MANUAL

CITY of WALTHAM, MA. PROJECT MANUAL

- Section 1** GENERAL SCOPE
- Section 2** DEMOLITION SCOPE
- Section 3** RINK CHILLER SPECIFICATIONS
 - a)** Ice Rink Refrigeration System
 - b)** Heat Reclaim System & Water Tank Modification
 - c)** Replace Secondary Fluid
- Section 4** NOT USED, INTENTIONALLY LEFT BLANK
- Section 5** NEW BOILER FOR HEATING SYSTEM DEHUMIDIFICATION
- Section 6**
 - a)** New Desiccant Dehumidifier
 - b)** Dehumidifier Ductwork & Ductsock
 - c)** Rink Air Management System
- Section 7** MISCELLANEOUS
 - a)** Painting
 - b)** Unit Masonry
 - c)** Steel frame at dehumidifier
 - d)** Roofing

SECTION 1 - GENERAL SCOPE

In accordance with sound engineering practices and acceptable methods of design associated with the ice rink industry generally, and the requirements of the City of Waltham specifically, the contractor shall furnish and install the materials and equipment described within the context of this specification.

All products shall be custom manufactured to conform with the existing conditions of the Veteran's Memorial Ice Rink as represented in the project drawings. The contractor will assume all duties required to execute a fully operational Indirect Ice Rink Refrigeration System in strict adherence to the specifications herein.

QUALIFICATION STATEMENT

It is the intention of this contract to have a fully functional ice rink refrigeration system constructed on proven technologies which reflect the demands of the attached specifications. The bidding contractor shall include the talents of a responsible Rink Contractor which specializes in indirect refrigeration systems and has no less than 5 years experience specifically with the design set forth by these documents.

The refrigeration system specified has certain high energy performance criteria which must be met by the bidding contractor. These stipulations of energy efficiency are mandatory prerequisites to bid. With no exception, the bidding contractor must provide no less than 3 referenced projects in which the ice making system operates in accordance with the high energy efficiency standards of the Rink Chiller described in these documents. The system and references must prove their design provides for a Low KW per ton performance by having the system operate to as low as a 50 degree condensing temperature when weather conditions dictate. A copy of references for systems which operate in this manner must be included with the bid documents.

CODES

All labor, materials, and designs set forth by the rink contractor shall be in compliance with the latest published codes governed by local jurisdiction.

- A) OSHA
- B) CITY of WALTHAM SPECIFIC BUILDING & MECHANICAL CODES
- C) AMERICAN STANDARD OF REFRIGERATION PIPING ASA B31.5
- D) AMERICAN STANDARD OF PRESSURE PIPING ASA B31.1
- E) AMERICAN STANDARD CODE FOR PRESSURE VESSELS
- F) AMERICAN NATIONAL STANDARD B9.1, SAFETY CODE FOR MECHANICAL ENGINEERING
- G) NATIONAL ELECTRIC CODE
- H) ASME CODE
- I) ARI AMERICAN STANDARD 590
- J) UL LISTED
- K) ASHRAE HANDBOOK FOR MECHANICAL ENGINEERING
- l)

SHOP DRAWINGS

The contractor shall submit comprehensive shop drawings depicting overall design and installation procedure in electronic format to the Owner's Project Manager. The following drawings shall be submitted:

- A) Fabrication drawings and full submittal package of the equipment manufactured by the contractor and associated accessories.
- B) Total CPM (Critical Path Method) drawing representing the project schedule by the rink contractor and time coordination required of all subcontractors.
- C) Site plan showing the location of equipment pads, equipment placement (including roof work), and other information necessary for proper equipment and work coordination.
- D) Piping isometrics & flow diagrams.
- E) Electrical power and control diagrams depicting the equipment design as well as site electrical work.
- F) Complete dehumidification system to include unit data, performance, layout, ductwork, insulation, through-wall penetrations, roof frame (dunnage), roofing repair.
- G) Complete Cooling Tower data, piping, insulation and performance.
- H) Shop fabrication drawings of steel frame for dehumidifier to include all connections

MUNICIPAL PLANCHECK

Submittal of sealed plans, engineering calculations, data, etc., as required by the City of Waltham for the purpose of plancheck and approval shall remain the responsibility of Owner's Project Manager. Owner's Engineer and/or Architect shall be responsible for seals, required attendance at plancheck meetings, coordination, and all other functions necessary to produce a complete set of rink construction plans conforming to, and approved by, local/state codes, ordinances, and regulations. Contractor shall be responsible for providing necessary plans, documents, and information requested by the Owner's Project Manager for the purpose of plancheck and approval. Contractor shall supply such plans on CD-ROM in Autocad 14 or later format upon the request of Owner's Engineer or Architect.

-end of section-

SECTION 2 - DEMOLITION

The contractor is responsible for the removal and legal disposal of all items identified on the project drawings including but not limited to the following activities:

- 1) Evacuation of all R-22 refrigerant from the existing two (2) chiller skids. The refrigerant shall be removed in accordance with EPA regulations for decommissioning a refrigeration system for disposal.
- 2) All refrigerant oil to be removed and properly disposed of.
- 3) Upon request, certification of proper removal and disposal shall be presented to the owner's project manager.
- 4) Remove all glycol and condenser water piping, valves, hangers, and specialties as identified on the project drawings.
- 5) Remove and dispose of both chiller skids including compressors, chillers, and condensers. The units may be cut apart or removed in whole at the discretion of the contractor.
- 6) Remove and dispose both glycol circulation pumps and accessories.
- 7) Ram identified units for chiller skids are to be removed and disposed.
- 8) Cooling tower to be removed and disposed.
- 9) Tower stand to be rehabilitated per the specification to accommodate the new cooling tower, or disposed and replaced at the contractor's discretion.
- 10) Boiler serving the building heating system is to be removed and disposed.
- 11) Electrical conduit and conductor not placed or sized suitable for the new equipment shall be removed and replaced.
- 12) Two KALWALL panel units will need to be removed where the ductwork for the new dehumidifier penetrates into the space. Panel units to be carefully removed and aluminum framework is to be retained.
- 13) Two small areas (Less than 3 square feet) of existing tar and gravel roofing and concrete deck is to be removed to allow installation of dehumidifier dunnage columns per plan details.
- 14) Concrete masonry units (blocks) are to be removed to allow for dehumidifier dunnage beams to bear on masonry per plan details

Note: disposal manifests to be furnished by the contractor on request.

-end of section-

SECTION 3 -A Rink Refrigeration System

Rink Contractor shall furnish and install two chillers operating in unison with each refrigeration skid having two compressors and two refrigerant circuits, 4 systems total. or approved equal/better, and as described in the specifications below. The contractor must meet each of the following requirements with the proposed system.

TRUE ENERGY EFFICIENCY IS CRITICAL FOR THIS INSTALLATION. THE CONTRACTOR SHALL BE REQUIRED TO DOCUMENT THE ENERGY EFFICIENCY RATIO (Co-efficient of performance.) OF THE SYSTEM PROPOSED. CALCULATIONS SHALL BE BASED UPON THE AVERAGE 8 ½ MONTH SEASON OF THE RINK, AND THE REFRIGERATION SYSTEM'S PERFORMANCE WITH CHANGES IN AMBIENT TEMPERATURES.

IT IS CRUCIAL THAT THE SYSTEM PROVIDE NO GREATER THAN THE ESTIMATED SUMMER C.O.P., AND PERFORM AT, OR BETTER THAN, THE ESTIMATED WINTER DESIGN C.O.P. VALUES LISTED BELOW. THE C.O.P. VALUES FOR THE SYSTEM SHALL BE CALCULATED FROM THE OPERATION OF THE ENTIRE SYSTEM, INCLUDING COMPRESSORS, CIRCULATION PUMPS, CONDENSER FANS, RINK PIPING SYSTEM, AND ALL OTHER COMPONENTS WHICH AFFECT ENERGY CONSUMPTION. MANUFACTURER PERFORMANCE DATA SHEETS, AS WELL AS C.O.P. CALCULATIONS MAY BE REQUESTED FOR DOCUMENTATION.

Bidders are expected to provide a system designed for a C.O.P. of no greater than 1.248 KW per Ton of refrigeration produced by the equipment.

The following shall be mandatory on all refrigeration systems considered:

- Variable Speed Pump System for providing variable secondary fluid flow rates in accordance with refrigeration capacity control.
- Multiple compressors, assured back-up reliability at all times. Four (4) compressors, minimum with four refrigerant circuits.
- Dual independent refrigerant circuits on each refrigerant skid.
- Low KW in rush required to reduce electrical demand.
- Vibration isolation,
- Sound-deadening compressor discharge mufflers.
- Integral, pre-wired control panel with microprocessor control with remote access capability.
- Automated and Manual transfer (Lead/Lag) switch feature.
- Multiple step capacity control.
- Open access to components for ease of service.
- Flooded dual evaporator on each chiller skid, fully insulated.
- Ozone Safe 134A, R-513, or R-507 operation.
- Compressor crankcase heaters.
- Replaceable core liquid line filter/driers.
- Split water cooled condenser refrigerant circuit design.
- Control voltage transformer.

City of Waltham, MA Veteran's Memorial Rink. Mechanical Upgrades.

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Southgate Consulting

- Freezestat evaporator protection.
- Microprocessor for complete system control and status.
- Flow switch protection.
- Single point power hookup.
- Adjustable time delay between compressor starts.
- Hour meter recording for each compressor.
- Service and alarm history maintained in the unit mounted microprocessor.
- Individual compressor circuit breakers.
- Liquid refrigerant level control valves.
- Liquid line sightglass/moisture indicator.
- Fuse/breaker control circuit protection.
- Active oil separation system and safeties.
- Each chiller skid is to be provided with rubber isolation mounting pads of at least 3" in height to assure a vibration free installation.
- High/low refrigerant pressure/temperature & oil pressure readouts in microprocessor.
- Cooling Tower Applications shall be provided with micriprocess controlled water regulating valve – one per chiller skid.
- Cooling Tower shall be sized for 1% wet bulb design.

High Performance Rink Chiller (HPRC) SPECIFICATIONS:

FURNISH AND INSTALL 2 (TWO) FACTORY ASSEMBLED, MULTIPLE ACCESSIBLE SCREW COMPRESSOR LIQUID CHILLER PACKAGE. THE SYSTEM SHALL HAVE A MINIMUM CAPACITY OF _104 TONS (52 TONS PER SKID) USING R-134a. UNITS SHALL COOL 720 GPM EACH OF 40 %, BY VOLUME PROPYLENE GLYCOL SOLUTION FROM 18 DEGREES TO 14 DEGREES FAHRENHEIT WHEN OPERATING AT 14 F DEGREES FAHRENHEIT.

CONSTRUCTION AND RATINGS SHALL BE IN ACCORDANCE WITH THE LATEST ARI, STANDARD 590, AND SHALL COMPLY WITH ANS-B9-1 SAFETY CODE, NATIONAL ELECTRIC CODE, AND APPLICABLE ASME & ASHRAE GUIDELINES.

COMPRESSORS

Shall be screw type, serviceable, semi-hermetic (open drive upon request) type as manufactured by Mycom, Frick, or approved equival or better (four total, two per skid). Compressors shall be equipped with suction and discharge service valves, automatic reset high pressure relief valve, internally discharged check valve, compressor inlet screens for all gas and liquid inlet ports, immersion type crankcase heaters, high efficiency oil separator with oil control system, oil reservoir with oil level glass, internal forced oil lubrication, discharge mufflers, a large primary oil filter followed by a 3 micron oil filter, external air cooled oil cooler, thermal/over voltage protection, high/low/oil pressure tappings for gauges & pressure controls, Compressor motor windings shall be cooled by suction gas passing over the motor windings.

Each compressor shall be factory mounted on vibration isolators, supplied with an operating oil charge, shall have a factory installed contactor, and protected with a manual reset, ambient insensitive magnetic circuitbreaker, and solid state power module for constant voltage monitoring of all three phases during operation. The circuitbreaker, and operational sequence of the power module, shall open all three (3) phases should an overload occur on any phase.

Each compressor shall be protected against lubrication failure by a differential pressure type oil failure control which shall provide a 120 second time delay upon start up to prevent nuisance cutouts. Oil failure switches shall be manual reset type, and shall shut down the individual compressor it protects upon a reduction in pressure differential.

Each refrigerant circuit shall have a high pressure and low pressure control, which shall shut down both compressors in the refrigerant circuit it protects. High pressure control shall monitor the discharge (high) side of the system and shall have a manual reset. The low pressure control shall be automatic reset and shall monitor the suction (low) side of the system and operate in an automatic pumpdown sequence.

EVAPORATOR

Shall be shell & tube type with two (2) flooded refrigerant circuits. Seamless 1/2" O.D. extended surface area copper tubes shall be rolled into the tube sheets. The shell shall be insulated with two (2) layers of 3/4" thick Armaflex type insulation, or equal. It also shall be equipped with one (1) inlet and one (1) outlet chilled water flange connection, and shall have a secondary side air bleeder tapped into the highest point on the shell, and a drain valve on the bottom. Secondary fluid pressure drop shall not exceed the prescribed amount at the design flow rate. "Flooded" type chillers are not acceptable. The Chiller barrel/Evaporator must be specifically designed and selected for this design criteria. Systems which are merely modified air conditioning units, or units not specifically designed for a 4 or less degree secondary fluid differential will not be acceptable.

ELECTRICAL (Filed Sub Bid, DCAMM Certification Required)

Each unit shall be supplied with a factory installed, pre-wired control panel with high, low, & oil pressure controls, low water temperature cutout, multiple step brine temperature controller, flow switch protection (field wired to terminals), and necessary timers, compressor breakers & contactors, control relays, and adjustable fan cycle controls for either and air cooled condenser or evaporative condenser selection. The control panel shall have a "power on" indicator light and a "run" indicator light for each compressor. A manual transfer switch shall be provided for reversing of lead & lag refrigerant circuits. Additionally, a manual transfer switch shall be provided to reverse lead & lag compressors within each refrigerant circuit.

Each refrigerant circuit shall have a manual pump down switch, and a pump down jog switch for shutdown and service capability. The electrical sequence shall be design as to permit automatic system re-start should a power failure occur without damage to the system. A 210 second time delay, and

pumpout sequence of the chiller, to prevent system slugging, must be provided for the restarting sequence with reintroduction of electrical power to the unit.

The unit shall operate on 480 volts 3 phase electrical service. The unit mounted control transformer shall provide 115 VAC, 60 cycle, single phase power to the control circuit. A control power circuitbreaker, and primary & secondary control fuses shall be installed as required.

WATER COOLED CONDENSERS

Water cooled chillers shall feature a water cooled condenser for each refrigerant circuit. Dual circuit chillers shall feature two condenser circuits. The condensers shall be factory mounted and piped as part of the chiller skid. The condenser shall be a shell & tube type unit equipped with integral-finned copper tubes, and shall have removable heads.

The tubes shall be roller expanded into a tube sheet. Epoxy, non-serviceable type condensers will not be acceptable. Construction shall comply with applicable ASME code. Each condenser shall be constructed to provide positive sub-cooling of the liquid refrigerant and be sized/constructed for low condensing operation. A pressure relief valve, purge cock, and liquid refrigerant shut off valve shall be provided on each condenser. Isolation and by-pass valves shall be included for normal servicing and isolation of each primary component within the condenser package.

Fan staging shall be controlled with adjustable pressure controls, set to maintain the lowest possible condensing temperature at any given ambient temperature. This shall also be accomplished with the least amount of fans to match the design approach conditions of the condenser to avoid excess fan operation. The settings shall also consider winter operation to avoid tower freeze-up.

The system shall operate with a "floating" head pressure in order to reduce the compressor KW consumption and increase volumetric capacity of each compressor during periods when the ambient temperature is below the maximum design ambient of the condenser. The refrigeration piping system shall be engineered in such a fashion as to prevent the occurrence of liquid line flashing at reduced head pressure. Equally, the refrigeration unit in its entirety shall be designed so that the added volumetric capacity of the compressors at low head pressures results in a significant increase in actual tonnage production.

Systems which must maintain a consistent head pressure in order to eliminate liquid line flashing and/or reduction in suction pressures, regardless of ambient temperature variations, shall not be acceptable, as they do not meet the efficiency requirements of this installation.

The Chillers equipped with the water cooled condensers shall be factory fabricated and shipped to the job site as a single, self-contained unit. Single condensers spilt for dual circuit operation are not acceptable.

COOLING TOWER

Contractor to supply an EVAPCO LSTE-4112 Cooling Tower or approved equal or better. The unit shall be oversized to provide for a low approach operation of wet bulb temperature versus condensing temperature.

The Cooling Tower unit shall be provided with staged fan operation. With axle fans, either a multiple fan arrangement or two speed fan drive can be employed. Centrifugal Blower units shall be equipped with VFD fan motor for reduced blower HP requirements at under-normal operation.

The existing steel frame support for the cooling tower supports an existing Evapco 4112. If an alternate cooling tower is proposed, the frame may require modification to support the proposed unit.

The frame is badly rusted. Contractor shall sandblast and paint the frame according to the specification put forward in Section 7 Painting.

VARIABLE FLOW RATE PUMPING SYSTEM

Shall also be furnished and installed by the contractor. The variable flow pumps are to be mounted on the existing brine pump pad..

Piping manifolds, service valves, check valves, pipe insulation, an electrical pump control panel, and electrical motor leads to be installed and ready for operation.

This design feature **must** provide a dedicated brine fluid flow rate for each stage of refrigeration capacity. Resistance through the entire secondary, or brine, piping system shall be calculated and applied to each stage design. Each stage of capacity shall maintain a three (3) degree Fahrenheit temperature differential through the evaporator when the system is operating at the design brine temperature. Systems which have varied brine temperature differentials at each stage of refrigeration capacity shall not be acceptable. Those designs which utilize undersized pumps and exceed the above prescribed temperature differential shall not be considered, as such designs must operate at lower compressor suction pressures to compensate for reduced pump flow.

System shall be provided with a pre-wired electrical control panel, including automatic control of pump staging, pump starters with thermal overload protection, properly sized pump breakers, a single point power hookup, and a terminal strip for interface with the rink chiller control panel. The pump control panel shall derive its control power from the rink chiller control transformer. The use of a separate control power source shall not be acceptable.

The control panel face shall be equipped with Hand/Off/Auto switches, and operation indicator lights for each pump.

Systems which do not provide automatic variable flow in accordance with refrigeration capacity shall be unacceptable. The use of a single, variable speed pump shall not be considered an acceptable equivalent to the specified system.

GENERAL SYSTEM DESIGN PERFORMANCE SPECIFICATION:

HIGH PERFORMANCE RINK CHILLER MODEL #	<u>2- 100 HP Units w/ 4 compressors</u>
REFRIGERATION MINIMUM CONNECTED HP:	<u>270 HP</u>
COMPRESSOR & MOTOR SPEED - RPM:	<u>1750</u>
COMPRESSOR TYPE:	<u>Screws</u>
REFRIGERANT TYPE:	<u>R-513, R-507, R-134a</u>
SECONDARY FLUID:	<u>40 % PG</u>
TOTAL GALLONS SECONDARY FLUID REQ'D:	<u>approx 3500 (exg)</u>
FULL LOAD REFRIGERATION TONNAGE:	<u>102</u>
SECONDARY FLUID DESIGN TEMP F.:	<u>14 & 18</u>
SECONDARY FLUID GPM @ 100% CAPACITY:	<u>720 GPM @120 FT. HD.</u>
SECONDARY FLUID GPM @ 50% CAPACITY:	<u>360GPM @45 FT. HD.</u>
COMPRESSOR SAT. SUCTION TEMP F.:	<u>11 F</u>
COMPRESSOR MAX CONDENSER TEMP F.:	<u>95 0 F</u>
NUMBER OF EQUALLY SIZED MOTORS:	<u>4@ 50 HP EACH</u>
ELECTRICAL CONDITIONS:	<u>480/3/60</u>
RINK PIPING SYSTEM:	<u>existing concrete floor</u>
CONDENSER DESIGN WET BULB F.:	<u>74</u>
COOLING TOWER FAN # HP:	<u>7.5</u>
NUMBER OF COOLING TOWERS	<u>1</u>
COOLING TOWER TONNAGE RATING EACH:	<u>135</u>
COOLING TOWER WTR PUMP HP:	<u>10 HP existing</u>
COOLING TOWER DESIGN WET BULB F.:	<u>74</u>
BRINE PUMP MAXIMUM BHP @ 100% CAPACITY:	<u>20 BHP</u>

BRINE PIPING REQUIREMENTS:

Brine piping shall be installed in accordance with the project design drawings. The contractor shall use SCH 80 PVC (polyvinyl chloride) pipe with solvent weld or flanged connections. PVC flanges must be SCH 80. Other fittings for PVC connections may be SCH 40, provided stress, vibration, or actual pipe weight does not exceed manufacturer's published limitations for the fitting used. The contractor shall be required to follow all accepted piping practices with the installation. Pipes shall be true & level, and shall be properly braced and supported as required.

Service valves shall be installed at the suction and discharge side of each pump, at the inlet and outlet of the strainer, and in the supply and return lines for isolation of the rink piping system, should it become

necessary. Service valves shall be lug type butterfly valves, minimum 125 lb. rating, as manufactured by Nibco Co., or approved equal or better.

A check valve shall be installed at the discharge of each brine pump to prevent circulation through non-operating pumps. Check valves shall be silent type lug checks, minimum 125 lb. rating as manufactured by Nibco Co., or approved equal or better.

After completion of the piping installation in strict compliance with the project drawings, the system shall be pressure tested with compressed air to a minimum of 30 PSI for two (2) hours. The piping system shall then be charged with the prescribed secondary fluid solution, air purged, and insulated as indicated in the project drawings.

WARRANTY

The contractor shall warrant the High Performance Rink Chiller system to be free from defects in material and workmanship, under normal use and service for a period of one (1) year from the date of acceptance.

SECTION 3 -B HEAT RECLAIM SYSTEM

In accordance with the project drawings, each chiller skid is to feature two (2) brazed plate heat exchangers sized to work as desuperheaters for each of the four refrigerant circuits. The desuperheaters will be sized at approximately 60,000 btuh each to serve as preheat to the building hot water system. The desuperheaters will be piped in such a manner to eliminate oil logging or liquid refrigerant backflow to the compressors. A by-pass line will be installed on the refrigerant circuit to permit system operation without refrigerant passing through the desuperheater if needed.

Proper piping practices are to be used to ensure the pipe connections are stress free from the systems vibration and normal operation. Thermometer wells and thermometers to be provided where shown on the drawings.

Fractional HP pumps for each chiller pair of desuperheaters shall be provided. Fractional HP pumps shall be all brass or stainless steel construction to avoid corrosion. Each pump identified as P1 & P2 shall be 24 gpm at the foot head determined by the contractor for the system pressure drop.

The P1 pump will be activated whenever compressor 1 or 2 are activated on chiller skid one.

The P2 pump will be activated whenever compressor 3 or 4 are activated on chiller skid two.

Piping shall be type L copper which is silver soldered together or made with crimp clamp connections. Pumps are to be fitted with suction strainers, check valves, service valves, and pressure gauges. An LED indication light to be provided at each pump junction box for easy owner verification of operation.

Water connection and distribution points for the two 250,000 BTUH water heaters shall be reconfigured to match the configuration on the project drawings. The intent is to convert one hot water tank to a pre-heat storage tank. The thermostat for the tank used for storage will be adjusted down to the lowest setting possible to prevent it from operating as a heater while still providing the owner the option to use it as a water heater if needed or desired.

-end of section-

SECTION 5 REPLACEMENT BOILER FOR HEATING SYSTEM

Remove and dispose of existing domestic water heater which services ceiling hung fan units in the non-rink areas. Remove and replace first flue section. Remove and replace piping to shutoff valve. Reconnect gas piping. Reconnect electrical low and high voltage wiring.

Existing unit to be replaced with a boiler of equal or better performance and of equal or better efficiency. Existing unit is a Burnham gas fired boiler rated at 330 BTUH in and 264 BTUH out.

This unit is NOT connected to or a part of the heat reclaim system.

-end of section-

SECTION 6-A DESICCANT DEHUMIDIFICATION

Furnish, install on steel dunnage, one CDI Model DH 138 or one EI Model E5000 dehumidifier (or approved equal or better).

Standard features to include:

- Totally pre-engineered ready-to operate package for outdoor applications.
- Packaged control system complete with unit mounted blowers and direct gas fired re-activation system.
- Installation only requires main electrical hook-up, gas connection, wiring of remote humidistat, and supply and return ductwork.
- Operates with a titanium gel desiccant wheel with drive system.
- All components by be serviceable through service doors.
- Units include all required controls, starters, safety devices, and wiring to comply with NEC.
- Unit comes with mounted disconnect for simple three phase connection.
- Unit is guaranteed against defects in material and workmanship for one year from date of shipment.
- Provide RAM indoor air quality unit in rink to monitor and control for CO, CO2, and NO2. A remote panel shall be located in the ice resurfacers room for control and interlock with alarms and building exhaust system.

GENERAL UNIT SPECIFICATIONS

Nominal Moisture Removal (50 deg F./45% RH)	115 lb/hr
Supply Fan	7.5 hp
Wheel Quantity	1
Reactivation Fan	3 hp
Process Air Flow - Max (460/3/60 FLA-MAX)	5,000 CFM
Natural gas	300 MBH

SECTION 6-B DEHUMIDIFICATION DUCTWORK INSTALLATION

Exterior ductwork shall be insulated and weatherproofed

Interior ductwork to be un-insulated spiral duct at the location depicted on the drawings. Ductwork may be of constant diameter or may reduce in diameter as air flow permits. Outflows shall be adjusted so that equal volume flows from each. Provide telltales at each register.

Penetrations for ductwork through existing translucent fiberglass panel will dictate the removal of two sections of this panel. The duct opening(s) through the panel shall be filled with insulated galvanized sheet metal or IMP (insulated metal panel). Flashing and counterflashing to be per panel manufacturer's recommendations. Aluminum cee channel frames are to be re-used.

SECTION 6-C AIR QUALITY MANAGEMENT SYSTEM

Sensor(s) shall be mounted at top of glass height within the rink space. Sensor shall monitor CO₂, CO and NO and shall be interlocked with the make-up air intake fan in the South gable end of the rink so that fan activates when unacceptable levels of gasses is present and will shut off fan when levels return to normal.

Sensor shall also read Relative Humidity and and be interlocked with and shall activate the Dehumidifier until pre-set level is reached.

Sensor shall have an audible and visual alarm.

-end of section-

MISCELLANEOUS

SECTION 7

Section 7-A PAINTING

Existing Cooling Tower Frame.

Existing cooling tower frame is to be sandblasted to bare metal after existing cooling tower is removed. The steel should be inspected for any severely damaged areas and brought to the attention of the owner's project manager (none were noted in a preliminary inspection by the structural engineer). Steel is to be painted with a zinc rich primer and 1 coat of zinc-rich cold-galvanizing paint by ZRC or equal. Minimum dry film thickness = 3 mil.

Contractor is to protect adjacent surfaces and the public sidewalk during sandblasting operations.

Contractor is to thoroughly clean the area from the products of the sandblasting operation.

Painting of concrete masonry

After infill work at dehumidifier steel has been completed, CMU shall be painted with one coat block filler and 2 coats masonry paint. UGL Drylock or equal. Coatings must be applied a minimum of 7 days after masonry construction. Units must be completely dry.

Painting of refrigeration equipment

Section 7-B UNIT MASONRY

Provide grouting, bearing plates and concrete masonry units as required to infill wall around and beneath openings for dehumidifier beams. Concrete masonry units to be normal weight 8" block or cement brick as required. Grout to be 3,000 psi.

7-C Steel frame dunnage at Dehumidifier.

Steel frame for dehumidifier shall be per drawings and shall be G-90 Galvanized. Connection bolts and bearing plates to be galvanized. All cuts, drill holes or field welds will be touched up with zinc rich paint.

7-D Roofing.

Existing roofing is built up tar and gravel on concrete deck. Roofing work to be per drawings and to be of similar type as existing. Cutting and patching of roof to be completed in a single day to avoid leaving an opening overnight.

Where concrete is removed to allow access to masonry below, use cement board layered to reach existing deck height, or, at contractor's option, replace concrete decking.

Pipe column legs to be flashed to roofing using a conical rubber gasket; Dek-Tite or equal.

-end of section-

CITY of WALTHAM, MA.
Veteran's Memorial Ice Rink.
Air Conditioning (ALTERNATE #1)
PROJECT MANUAL

Section 1	GENERAL SCOPE
Section 2	RINK AIR CONDITIONING SPECIFICATIONS
	a) AIR HANDLING UNIT
	b) AIR COOLED CONDENSER
Section 3	INSTALLATION
Section 4	TESTING AND BALANCING

SECTION 1 - GENERAL SCOPE

In accordance with sound engineering practices and acceptable methods of design associated with the ice rink industry generally, and the requirements of the City of Waltham specifically, the contractor shall furnish and install the materials and equipment described within the context of this specification.

All products shall be custom manufactured to conform with the existing conditions of the Veteran's Memorial Ice Rink as represented in the project drawings. The contractor will assume all duties required to execute a fully operational Indirect Ice Rink Refrigeration System in strict adherence to the specifications herein.

QUALIFICATION STATEMENT

It is the intention of this contract to have a fully functional ice rink air conditioning system constructed on proven technologies which reflect the demands of the attached specifications. The bidding contractor shall include the talents of a responsible HVAC Contractor to furnish and install the equipment.

CODES

All labor, materials, and designs set forth by the rink contractor shall be in compliance with the latest published codes governed by local jurisdiction.

- A) OSHA
- B) CITY of WALTHAM SPECIFIC BUILDING & MECHANICAL CODES
- C) AMERICAN STANDARD OF REFRIGERATION PIPING ASA B31.5
- D) AMERICAN STANDARD OF PRESSURE PIPING ASA B31.1
- E) AMERICAN STANDARD CODE FOR PRESSURE VESSELS
- F) AMERICAN NATIONAL STANDARD B9.1, SAFETY CODE FOR MECHANICAL ENGINEERING
- G) NATIONAL ELECTRIC CODE
- H) ASME CODE
- I) ARI AMERICAN STANDARD 590
- J) UL LISTED
- K) ASHRAE HANDBOOK FOR MECHANICAL ENGINEERING
- I) NATIONAL MECHANICAL CODE

SHOP DRAWINGS

The contractor shall submit factory specifications and manufacturer's cut of all equipment to be supplied. The specifications shall include all data required to verify and install the equipment.

SECTION - 2 Rink Air Conditioning System

A. Air Handling Unit

1. All units are shrink wrapped for complete protection during transit
2. Air-flow 8,000 nominal cfm
3. Horizontal draw-thru arrangements
4. Double wall construction
5. Belt driven, forward curved blowers
6. Direct expansion (DX) coil
7. Parallel blade dampers on mixing boxes
8. 1-1/2 lb density insulation or optional foil-faced 3 lb density insulation
9. Certified performance in accordance with AHRI Standard 410 and 430
10. Galvanized steel construction
11. Precision-balanced fan wheels limit vibration and eliminate abnormal stress on bearings and other components
15. Internally mounted motor and belt drive package

16. Sloped, double-wall stainless steel drain pan complies with ASHRAE Standard 62
17. Double-wall hinged access panels

18. Blower housing serviceable without disconnecting ductwork
19. Rugged pillow-block bearings rated at 200,000 hours average life
20. Tool-less filter change
21. 2-in.angled filter sections

B. Condensing Unit

1. Condensing unit EERs up to 12.4 and IPLV up to 18.4
2. Unit performance rated in accordance with AHRI Standard 365
3. Full capacity range single-circuit unit
4. Hermetic scroll compressors with option for Digital compressor for superior part-load performance
5. Novation® microchannel heat exchanger (MCHX) condenser coils with option for E-coated Novation condenser coils
6. Compressor with neoprene isolators and oil heater(s)
7. Galvanized steel cabinet, bonderized and finished with baked enamel, 500-hour salt-spray test
8. High and low-pressure protection
9. Compressor overload protection
10. Loss of charge and low suction superheat protection
11. Self contained 24-v CCN (Carrier Comfort Network) controls including transformer
12. Low ambient head pressure control
13. UL, CSA, and ETL approved
14. Oil-level sight glass, filter driers, liquid line solenoid valve
15. Access panel accessibility to compressor and control box
16. Compressor suction service valves and liquid shutoff valves
17. Shipped with nitrogen holding charge
18. On-the-ground installation
19. 24V control circuit transformer permits quick, easy wiring of thermostats
20. One-year parts only compressor
21. One year parts only on all other parts

SECTION 3 INSTALLATION

A. Demolition

1. Remove and legally dispose of existing steel frames (4) supporting the existing electric dehumidification units.
2. Remove existing dehumidification units. Units to be transported to a designated City storage facility for possible re-use by the owner.

3. Remove and legally dispose of asphalt pavement (2 locations) and lawn areas (2 locations) to allow for installation of reinforced concrete condenser pads. Remove any underlying organic material.
4. Remove and legally dispose of asphalt roof shingles just prior to installation of rain hoods. Removal area to be size of nailing flange plus 12" in all directions. (5'-6" X 6'-0")

B. Air Handler and Ductwork

1. Install the air handling unit on platform as described herein.
3. There shall be vibration isolators on the air handling unit.
4. There shall be flexible connections between the ductwork and the air handling unit.
5. Insulate the ductwork per code.
6. Fresh air intake to be via 30" X 30" roof mounted "gooseneck" type rain hood.
 - a. Inlet portion of hood to be minimum 1'-6" above plane of roof.
 - b. Material to be minimum 20 ga galvanized sheet metal.
 - c. Flashing flange to be soldered or set in bed of mastic to upright.
 - d. Flange to extend 12" on bottom and 18" on uphill.
 - e. Flange to conform to existing roof slope (approx 4:12) and shall have a diverting cricket on the uphill slope.
8. Controls shall be via a single programmable thermostat in the rink manager's office with remote sensor in the rink space. wiring by this contractor.

C. Condensing Unit

1. Mount new condensing unit on a concrete pad that is furnished and installed as described herein.
2. Condensing unit to be secured to concrete pad with CIP anchors or epoxy fasteners by Hilti or approved equal.
3. Insure vibration isolators are in place and operable.
4. Furnish and install suction and liquid lines and charge the systems. Passage for line sets to be within appropriately sized PVC conduit and cored (not drilled) through masonry adjacent to the condenser pad. Pipe penetrations to be thoroughly sealed

D. Concrete Work/Earth Work

1. Concrete pads to be 6" larger than condensing unit in all dimensions and of thickness and reinforcing as detailed in SSK-3. (101" X 63")
2. Set forms for pads so that top is at +/- 1" above surrounding grade.
3. If removal of organic material is deeper than proposed pad, infill with ¾" crushed stone or processed gravel.

E. Carpentry/Roofing/Painting

1. Furnish and install air handler platforms (4) as prescribed in SSK-3. Follow hanger manufacturers prescribed fastening details.
2. New platforms to receive penetrating stain (minimum 2 coats) to match, as closely as possible, the color of the trusses.

3. Roofing work to include a single layer of WR Grace Ice and Water Shield (or approved equal). Shingles to be 3 tab fiberglass to match existing as closely as possible in color and configuration. Shingles to carry a minimum 25 year warranty.

F. Protective fencing at Condenser Units

1. Provide medium duty vinyl coated chain link fencing 4' high with top and bottom rail. Posts are to be set in concrete. Provide 36" wide gate facing service panel of Condenser Unit. Enclosure may be 3 sided with termination posts against the existing CMU wall. Dimensions to be approximately 13' X 8'. Ensure adequate clearances at service points on condensers.

F. Electrical

1. **General** - The complete electrical system will be designed and installed in accordance with the National Electric code and all other applicable codes.
2. **Existing Service.** The existing service is a 800A 277/480 3ph located in the electrical room as depicted on the drawings. The new 225A power panel feeding the exterior pad mounted condensers will be located on the opposite wall adjacent to the existing lighting/house panels. Provide a waterproof wall penetration and disconnect at each condenser location. Note: Disconnect may be eliminated if units are supplied with integral disconnect switch.
3. **Panelboards and Breakers-** will be manufactured by Square D., Westinghouse, General Electric, ITE or equal. Each panel will have a minimum of ten percent (10%) spare breaker capacity. Panelboards will have NEMA 1 general-purpose enclosures and will be surface mounted as required. All panelboards will be rated for the intended voltage and will be in accordance with the Underwriters Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and will be so labeled. The circuit breakers in the panelboard will be quick-make, quick-break, trip indicating, and be of the bolt-in type. These breakers will also be manually operated and closed at will and will indicate the "on" and "off" position of the handle.
4. **Conductors-** will be 600-volt insulation copper. Conductors larger than No. 2 (100A) may be aluminum (unless prohibited by equipment manufacturer(s). No wire smaller than No. 12 AWG will be used for power or lighting and no wire smaller than No. 14 AWG will be used in any control or signal circuit.
5. **Power to Interior Air Handling Units:** Use existing 30A circuits (4) which currently feed the electric dehumidifiers scheduled for demolition. These disconnects are located on the wall adjacent to the existing dehumidifiers (see Note 1 on drawing H-1 for the AC alternate). Extend the feeder to each new AHU and provide a new disconnect adjacent to the AHU for each.

It is the intent of this project to have all conduit and wire (pipe and pull) for all main feeders and branch circuits.

SECTION 4 Testing and Balancing

1. After the systems and have been filled, wired and started up, the units shall be balanced.
2. Adjust supply registers and motor sheaves as required to obtain the design CFM.

City of Waltham, MA Veteran's Memorial Rink. Air Conditioning.

Pg 5

Southgate Consulting.

3. Take readings on all the motors and fans as to current draw.
4. Provide written documentaion of all readings and ratings on all four (4) systems.

In areas of the specification which may not be defined in finite detail, the contractor is responsible to ensure all materials and installation both comply with manufacturers published guidelines for the equipment used and meets all local and state code requirements.

REPORTS



EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 131702483

Customer ID: EAF166

Customer PO:

Project ID:

Attention: Chris Eustis
EFI Global, Inc.
155 West Street, Suite 6
Wilmington, MA 01887

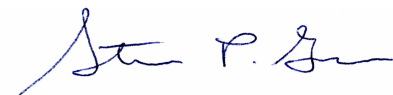
Phone: (781) 801-7464
Fax: (978) 688-5494
Received Date: 06/09/2017 11:17 AM
Analysis Date: 06/09/2017
Collected Date:

Project: 98350-06293 / 295 Totten Pond Rd, Waltham, MA

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
02A <small>131702483-0001</small>	Roof - Black Tar and Gravel	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02B <small>131702483-0002</small>	Roof - Black Tar and Gravel	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01A <small>131702483-0003</small>	Boiler Room - White Fiberglass Material	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B <small>131702483-0004</small>	Boiler Room - White Fiberglass Material	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)
Elizabeth Stutts (4)


Steve Grise, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3, VT AL998919, Maine Bulk Asbestos BA039

Initial report from: 06/09/2017 14:14:09



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 786-5974

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cinnaminsonleadlab@emsl.com

EMSL Order: 201705727

CustomerID: EAFI66

CustomerPO:

ProjectID:

Attn: **Chris Eustis**
EFI Global, Inc.
155 West Street, Suite 6
Wilmington, MA 01887

Phone: (978) 688-3736
Fax: (978) 688-5494
Received: 06/12/17 9:40 AM
Collected: 6/9/2017

Project: **98350-06293**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
Pb01	201705727-0001	6/9/2017	6/12/2017	<0.0080 % wt
Site: Blue paint				

Phillip Worby, Lead Laboratory Manager
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 06/12/2017 13:55:23

Michael E. Waterman, PE.

STRUCTURAL ENGINEERING
2A Austin Kelly Lane
Southborough, MA. 01772

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May 11, 2017

Richard Southgate
Southgate Consulting
85 Westen Avenue
Essex, MA 01929

Ref: **Waltham Ice Rink**
Waltham, MA

STRUCTURAL REPORT

On May 11, 2017, I visited the existing building to observe the condition of an existing exposed structural steel support structure that is currently supporting an existing mechanical unit. The proposal is to replace the existing unit with a new unit of similar size and weight.

The support structure consists of structural steel round columns, with lateral diagonal bracing, and steel wide flange beams. The condition of the existing steel is fair. There is rusting of the steel throughout, severe in a few isolated spots. However the overall condition is adequate for continued use.

The existing steel should be sandblasted to bare steel, removing all rust, any severely damaged spots should be reinforced with welded steel plates, to be determined once the cleaning of the steel is complete. Then all steel should be painted with a galvanizing ZRC paint..

If there are any questions or comments please contact me.

Signed,

Michael E. Waterman, PE.

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June 15, 2017

Mr. Nick Abruzzi
Director, Parks & Recreation
City of Waltham
510 Moody Street
Waltham, Massachusetts 02453

**RE: Limited Pre-Renovation Asbestos & Lead Paint Survey
Veterans Memorial Skating Rink
295 Totten Pond Road
Waltham, Massachusetts
MA OSD Contract Number: OSD-DCAMM PRF67
EFI Project No. 98350-06293**

Dear Mr. Abruzzi:

EFI Global, Inc. (EFI) performed a limited pre-renovation asbestos and lead paint survey on the roof, exterior water holding tank, and in the boiler room (Project Area) of the Veterans Memorial Skating Rink located at 295 Totten Pond Road in Waltham, Massachusetts (Site).

SURVEY PROCEDURES

EFI asbestos inspector, Mr. Christopher Eustis, conducted the site visit and asbestos testing on June 9, 2017. Samples of suspect ACMs identified during the survey were collected and submitted under chain of custody protocol to EMSL Analytical, Inc. (EMSL) of Woburn, Massachusetts, a Massachusetts-licensed laboratory. EMSL is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos fiber analysis which is administered by the National Institute of Standards and Testing (NIST). The samples were analyzed using polarized light microscopy (PLM) with dispersion staining via EPA's "Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93/116). Asbestos concentrations for the samples were determined by visual area estimation. Commonwealth of Massachusetts asbestos regulations define an ACM as any material containing greater than or equal to one percent asbestos.

EFI also collected a paint chip sample of the paint on the water holding tank for lead analysis. Lead analysis was conducted by EMSL using atomic absorption spectrometry (AAS) in accordance with US EPA method SW846-7420.

SURVEY RESULTS

Asbestos

The following suspect ACMs sampled by EFI were reported by EMSL as containing no detectable concentration of asbestos:

- White fiberglass sealant
- Black tar and gravel

A copy of the laboratory report prepared by EMSL is presented in Attachment A. .

Lead Paint

EMSL reported that the blue paint on the water holding tank contained a lead concentration of <0.080% by weight. This lead concentration is below the US EPA regulatory limit of 0.5% by weight, which is the threshold for classification as a “lead based paint.”

See the Regulatory Discussion below for additional regulatory implications. A copy of the laboratory report prepared by EMSL is presented in Attachment B.

REGULATORY DISCUSSION

OSHA defines any detectable concentration of lead in paint as a potential lead exposure hazard to workers performing construction or demolition work that disturbs these surfaces, as even small concentrations of lead can result in unacceptable employee exposures. The level of exposure varies based upon the lead concentration, method of removal, and other workplace conditions. Since these conditions can vary greatly, the OSHA Lead Construction Standard (29 CFR 1926.62) requires exposure monitoring or the use of historical or objective monitoring data to ensure that employee exposures do not exceed the OSHA action level of 30 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) and the OSHA permissible exposure limit (PEL) of 50 $\mu\text{g}/\text{m}^3$.

OSHA requires that contractors monitor employee exposures if coated surfaces with paint containing lead are impacted during construction or demolition. Contractors and employers of staff who may disturb these materials are obligated to perform a negative exposure assessment in accordance with OSHA regulations to document that exposure to lead does not exceed the OSHA action level and the PEL.

OSHA states that the employer must treat employees as if they would be exposed above the PEL until the employer 1) performs an exposure assessment that documents that employees are not exposed above the PEL or 2) can supply prior data regarding the same type of work which may exempt them from the standard. The OSHA Lead Construction Standard applies to many construction activities including the following:

- manual demolition of structures, manual scraping, manual sanding, and use of heat gun where lead-containing coatings or paints are present;

- abrasive blasting enclosure movement and removal;
- power tool cleaning;
- lead burning;
- using lead-containing mortar or spray painting with lead-containing paint;
- abrasive blasting, rivet busting, or welding, cutting, or burning on any structure where lead-containing coatings or paint are present;
- cleanup activities where dry expendable abrasive are used; and
- any other task the employer believes may cause exposure in excess of the PEL.

The contractor must provide respiratory protection, protective work clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until an exposure assessment has determined that the work activity will result in an exposure below the PEL. Additional requirements under the standard include a written compliance program, as well as, record keeping.

The contractor must also characterize and dispose of all dust, debris, and blast media in accordance with US EPA and Massachusetts Department of Environmental Protection regulations. This includes waste characterization of dust, debris and blast media generated during paint removal activities via the toxicity characteristic leaching procedure (TCLP).

CONCLUSIONS

The suspect ACMs sampled by EFI were reported by EMSL as containing no detectable concentration of asbestos.

The lead concentration within the blue paint on the water holding tank is very low and less than the US EPA regulatory limit of 0.5% by weight for classification as a "lead based paint." As stated above, the OSHA Lead Construction Standard considers any concentration of lead to be a potential for worker exposure, if materials coated with paint containing lead are disturbed during renovation or demolition activities.

RECOMMENDATIONS

If suspect ACMs other than the above-referenced materials are identified during renovation activities, EFI recommends that they be sampled by a Massachusetts-licensed asbestos inspector and analyzed by a Massachusetts-licensed asbestos analytical laboratory.

It is recommended that construction or demolition personnel conducting work at the facility comply with applicable OSHA Lead Construction Standard requirements during all construction activities at the Site.

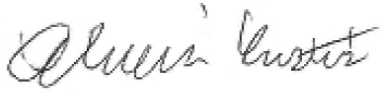
LIMITATIONS

EFI's survey was limited to those portions of the Project Area accessible by reasonable and ordinary means. EFI did not perform destructive testing and investigations to identify suspect ACMs within the facility. EFI's inspection did not include an evaluation of underground foundation

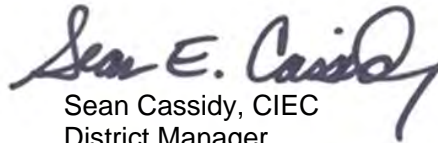
damp-proofing, transite water/sewer piping, and materials that may be present behind solid walls/ceilings and within mechanical and electrical equipment at the facility.

EFI is pleased to provide environmental consulting services to the City of Waltham. If you have any questions regarding the contents of this report, or require additional information, please do not hesitate to contact Sean Cassidy at 978-886-3712. Thank you for the opportunity to serve your environmental needs.

Sincerely,
EFI Global, Inc.



Christopher Eustis
Environmental Scientist



Sean Cassidy, CIEC
District Manager

Attachments:

- Attachment A - Asbestos Laboratory Report
- Attachment B - Lead Laboratory Report
- Attachment C - Photographs

ATTACHMENT A
ASBESTOS LABORATORY REPORT



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<http://www.EMSL.com/bostonlab@emsl.com>

EMSL Order: 131702483

Customer ID: EAF166

Customer PO:

Project ID:

Attention: Chris Eustis
EFI Global, Inc.
155 West Street, Suite 6
Wilmington, MA 01887

Phone: (781) 801-7464
Fax: (978) 688-5494
Received Date: 06/09/2017 11:17 AM
Analysis Date: 06/09/2017
Collected Date:

Project: 98350-06293 / 295 Totten Pond Rd, Waltham, MA

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
02A <small>131702483-0001</small>	Roof - Black Tar and Gravel	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02B <small>131702483-0002</small>	Roof - Black Tar and Gravel	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01A <small>131702483-0003</small>	Boiler Room - White Fiberglass Material	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B <small>131702483-0004</small>	Boiler Room - White Fiberglass Material	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Elizabeth Stutts (4)

Steve Grise, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3, VT AL998919, Maine Bulk Asbestos BA039

Initial report from: 06/09/2017 14:14:09



131702483

187 Ballardvale St, Suite A215
 Wilmington, MA 01887
 Tel: 978-688-3736
 Tel: 800-659-1202
 Fax: 978-688-5494
 www.efiglobal.com

BULK SAMPLE CHAIN OF CUSTODY FORM

Your Name: <u>Chris Eustis</u>	Bill to: <u>Same</u>
Company: <u>EFI Global</u>	Address: _____
Address: <u>155 West St.</u>	_____
<u>Suite 6</u>	City/State: _____ Zip: _____
City/State: <u>Wilmington, MA</u> Zip: <u>01887</u>	PO #: _____

Project Information

Project #/Name: 98350-06293 295 Totten Pond rd. Northham, MA
 Results To: Christopher_Eustis@efiglobal.com Tel: (978) 688-3736
 Alternate: Sean_Cassidy@efiglobal.com Fax: (978) 688-5954

Requested Turnaround Time

RUSH 1 Day 2 Day 3 Day 5 Day

Stop at first positive ^{bhr} Y or N Analyze all plaster and joint compound samples

Media and Methodology

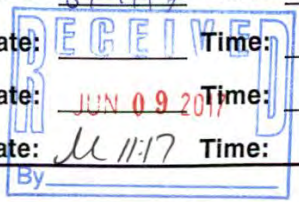
PLM - BULK EPA 600/R-93/116 Point Count Gravimetric

SAMPLE ID	HA #	TYPE OF MATERIAL	LOCATION	QUANTITY
<u>02A,B</u>		<u>Black tar and gravel</u>	<u>Roof</u>	
<u>01A,B</u>		<u>white fiberglass mat</u>	<u>Boiler room</u>	

Total Number of Samples Submitted: 4 Chris Eustis

Signatures

Relinquished By: [Signature] Date: 6/9/17 Time: _____
 Received By: _____ Date: _____ Time: _____
 Relinquished By: _____ Date: JUN 09 2017 Time: _____
 Received By: _____ Date: 6/11/17 Time: _____



ATTACHMENT B
LEAD LABORATORY REPORT

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 786-5974

<http://www.EMSL.com>cinnaminsonleadlab@emsl.com

EMSL Order: 201705727

CustomerID: EAFI66

CustomerPO:

ProjectID:

Attn: **Chris Eustis**
EFI Global, Inc.
155 West Street, Suite 6
Wilmington, MA 01887

Phone: (978) 688-3736
 Fax: (978) 688-5494
 Received: 06/12/17 9:40 AM
 Collected: 6/9/2017

Project: 98350-06293

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
Pb01	201705727-0001	6/9/2017	6/12/2017	<0.0080 % wt
Site: Blue paint on Water Tower				

Phillip Worby, Lead Laboratory Manager
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Report Amended: 06/13/2017 12:02:25 Replaces the Initial Report 06/12/2017 13:55:28. Reason Code: Client-Change to Sample ID

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

261705727

PHONE:
FAX:

Company: EFI Global		EMSL-Bill to: <input type="checkbox"/> Different <input checked="" type="checkbox"/> Same <small>If Bill to is Different note instructions in Comments**</small>	
Street: 155 West Street		<i>Third Party Billing requires written authorization from third party</i>	
City: Wilmington	State/Province: MA	Zip/Postal Code: 01887	Country: US
Report To (Name): Chris Eustis		Telephone #:	
Email Address: Christopher.Eustis@efiglobal.com		Fax #:	Purchase Order:
Project Name/Number: 98350-06293		Please Provide Results: <input type="checkbox"/> FAX <input type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: MA		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* <input type="checkbox"/> ASTM <input type="checkbox"/> non ASTM *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

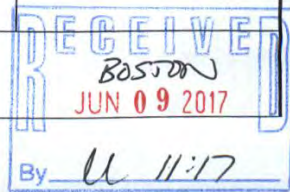
Name of Sampler: **Chris Eustis** Signature of Sampler: *[Signature]*

Sample #	Location	Volume/Area	Date/Time Sampled
Pb01	Blue paint connector tower		6/9/17

Client Sample #'s: **-** Total # of Samples: **1**

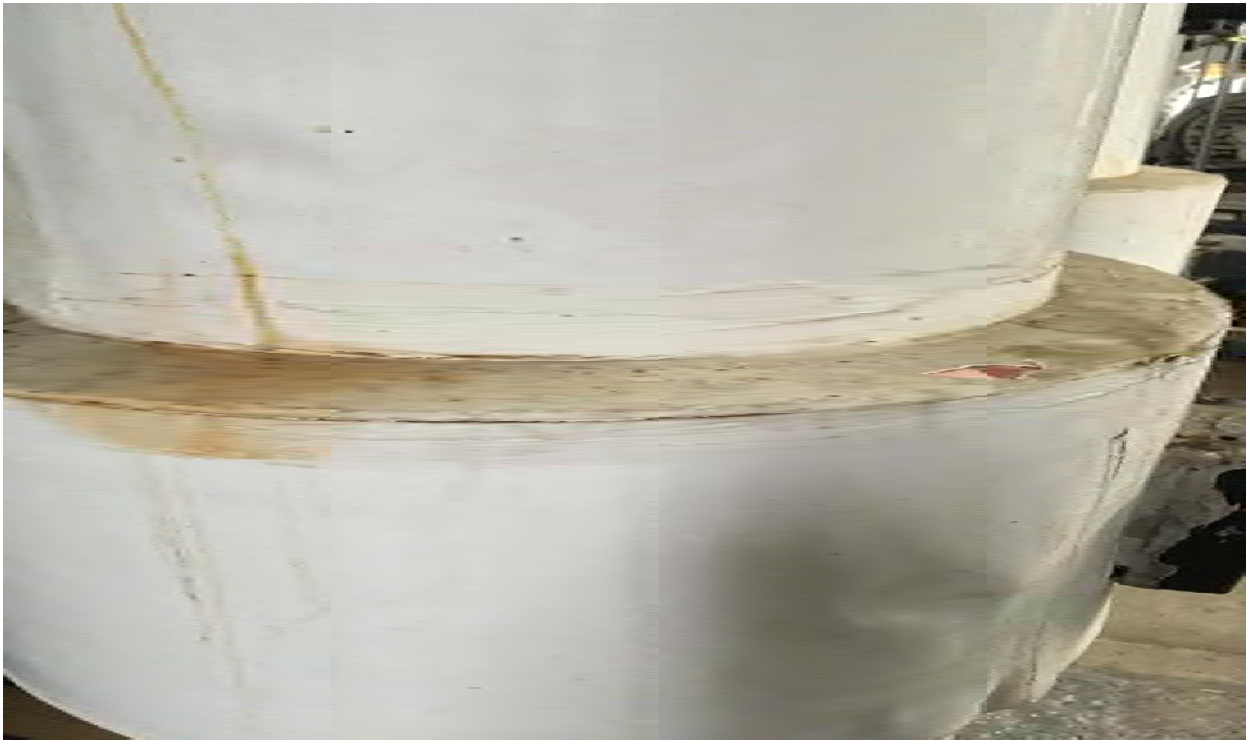
Relinquished (Client): <i>[Signature]</i>	Date: 6/9/17	Time:
Received (Lab): <i>[Signature]</i>	Date: 6/12/17	Time:

Comments:



ATTACHMENT C
PHOTOGRAPHS

Photographs



White fiberglass sealant



Boiler room



Tar and gravel roof

DRAWINGS

City of Waltham VETERAN'S MEMORIAL RINK

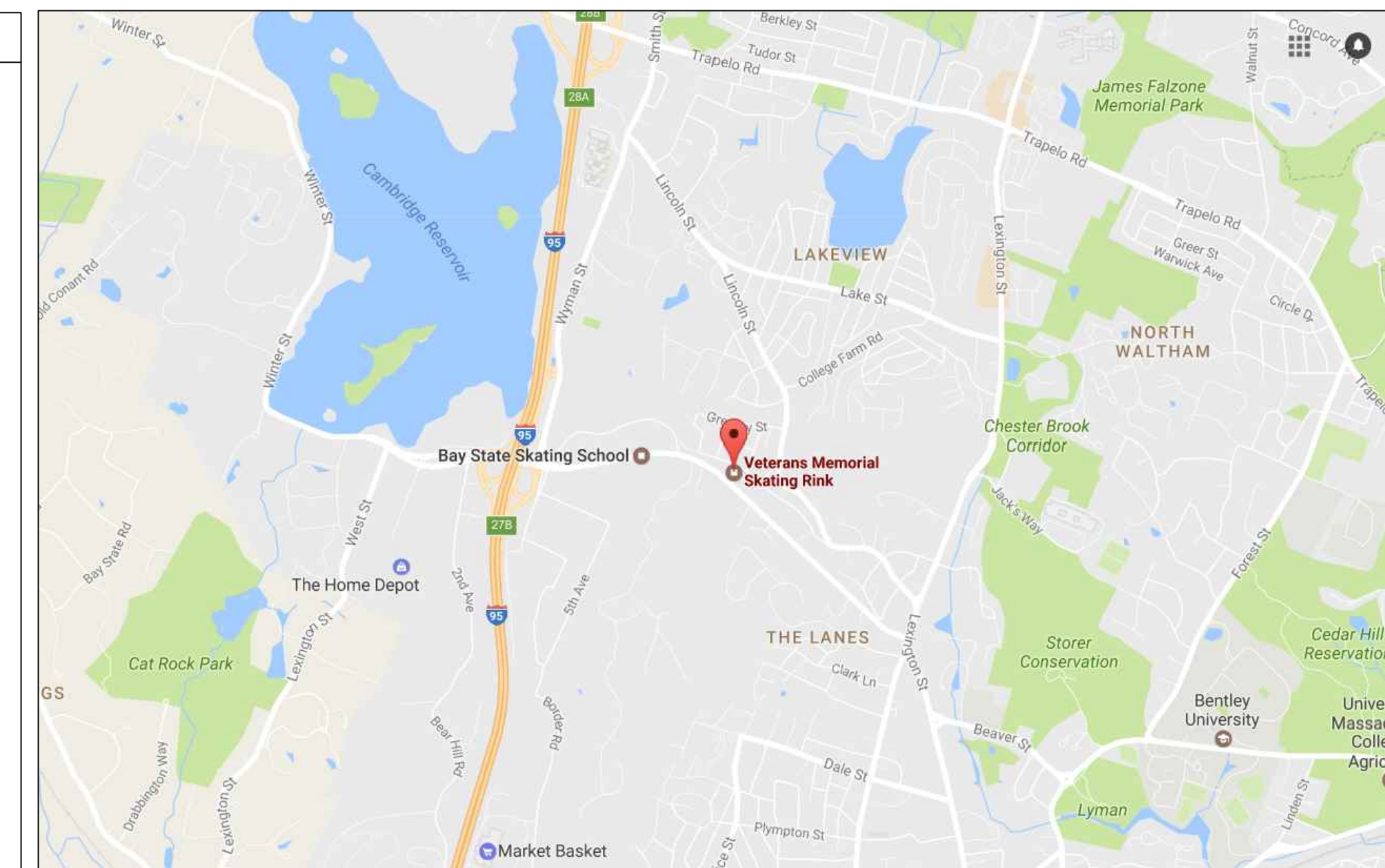
295 TOTTEN POND ROAD, WALTHAM MA

MECHANICAL UPGRADE PROGRAM

DRAWING LIST

- COVER PAGE
- FLOOR PLAN
- DEMO PLAN
- NEW EQUIPMENT
- DETAIL 1-A
- DETAIL 2-A
- DEHUMIDIFIER DETAILS
- POWER FEEDER
- CONDENSER WATER
- GLYCOL LOOP
- HEAT RECLAIM

TYPICAL PLUMBING SYMBOLS				TYPICAL ELECTRICAL SYMBOLS	
FLAT LINE	ISOMETRIC				
					DISCONNECT
					RECEPTACLE
					XXA CIRCUIT BREAKER
					MOTOR
					EXHAUST FAN
					SET
					OL OVERLOAD
					M MOTORIZED REGULATING VALVE
					FLOW SWITCH
					TRANSFORMER



CJL Engineering
232 Horner Street
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Southgate Consulting
85 Westen Avenue
Essex, MA 01929

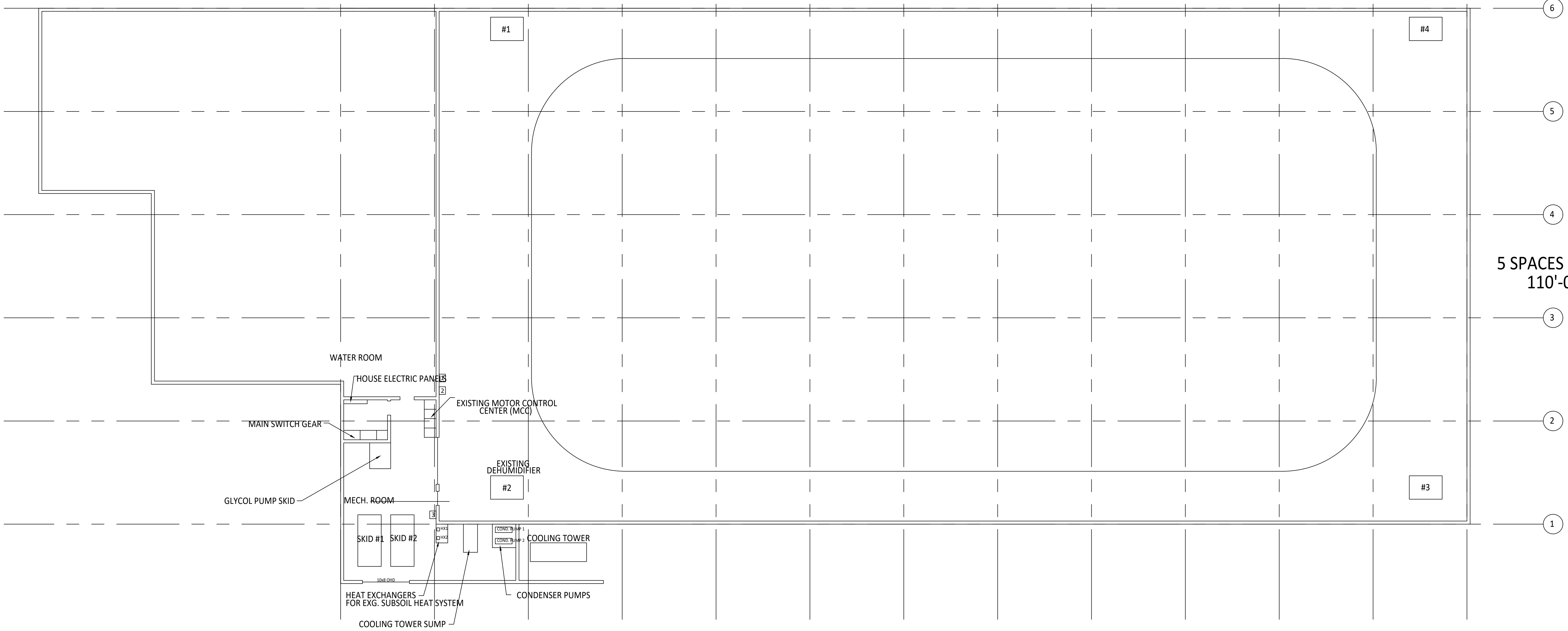
PAGE 1 OF 12

PROJECT
WALTHAM VETERAN'S RINK
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS

DRAWING TITLE
COVER SHEET

12 SPACES AT 20'
240'-0"

A' A B C D E F G H I J K L



5 SPACES AT 22'
110'-0"

6
5
4
3
2
1

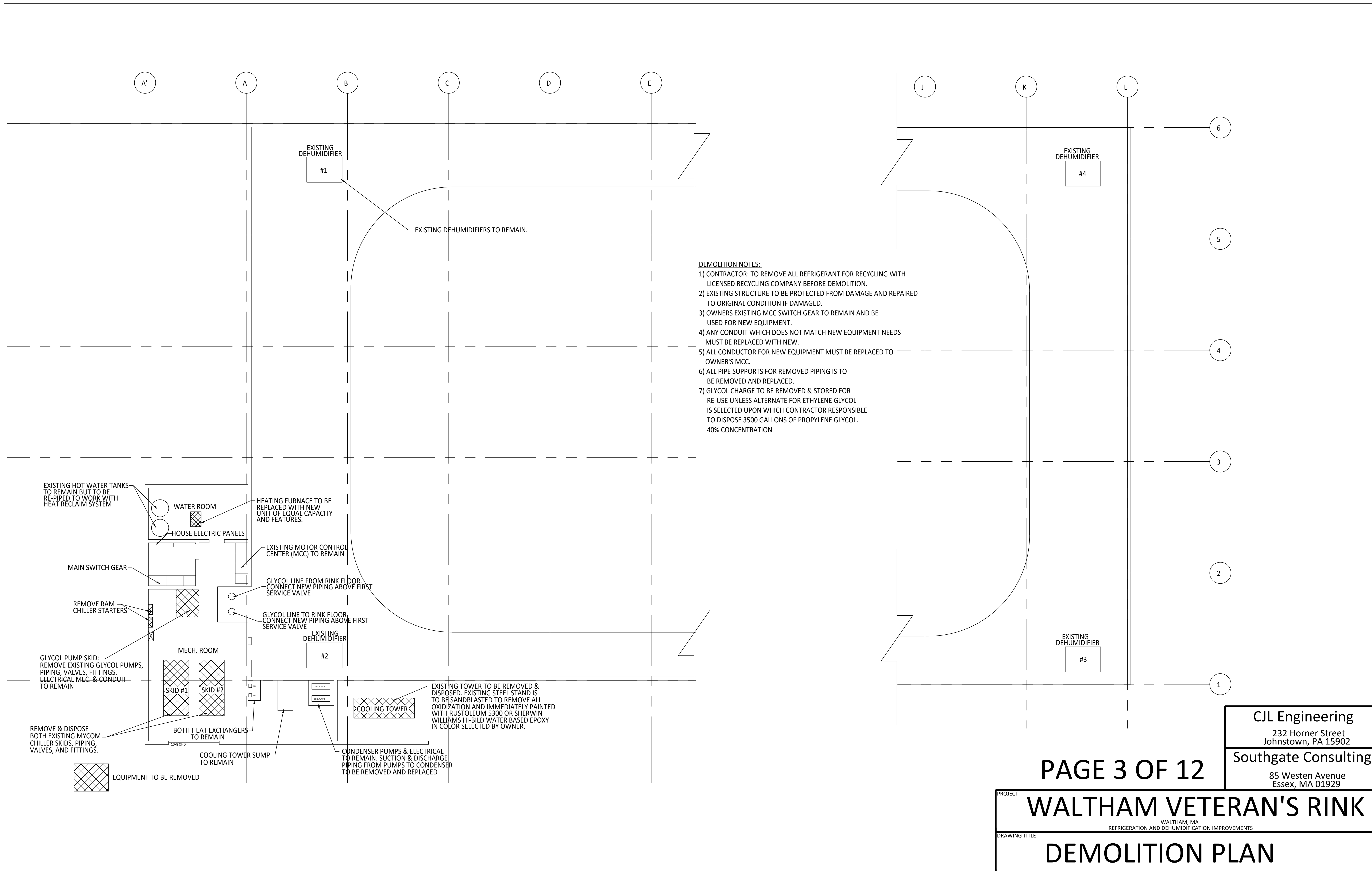
WATER ROOM
HOUSE ELECTRIC PANELS
MAIN SWITCH GEAR
GLYCOL PUMP SKID
MECH. ROOM
SKID #1 SKID #2
HEAT EXCHANGERS FOR EXG. SUBSOIL HEAT SYSTEM
COOLING TOWER SUMP
EXISTING MOTOR CONTROL CENTER (MCC)
EXISTING DEHUMIDIFIER
COOLING TOWER
CONDENSER PUMPS

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Johnstown, PA 15902

Southgate Consulting
85 Westen Avenue
Essex, MA 01929

PAGE 2 OF 12

PROJECT
WALTHAM VETERAN'S RINK
REFRIGERATION AND HUMIDIFICATION IMPROVEMENTS
DRAWING TITLE
EXISTING FLOOR PLAN



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Johnstown, PA 15902

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Essex, MA 01929

PAGE 3 OF 12

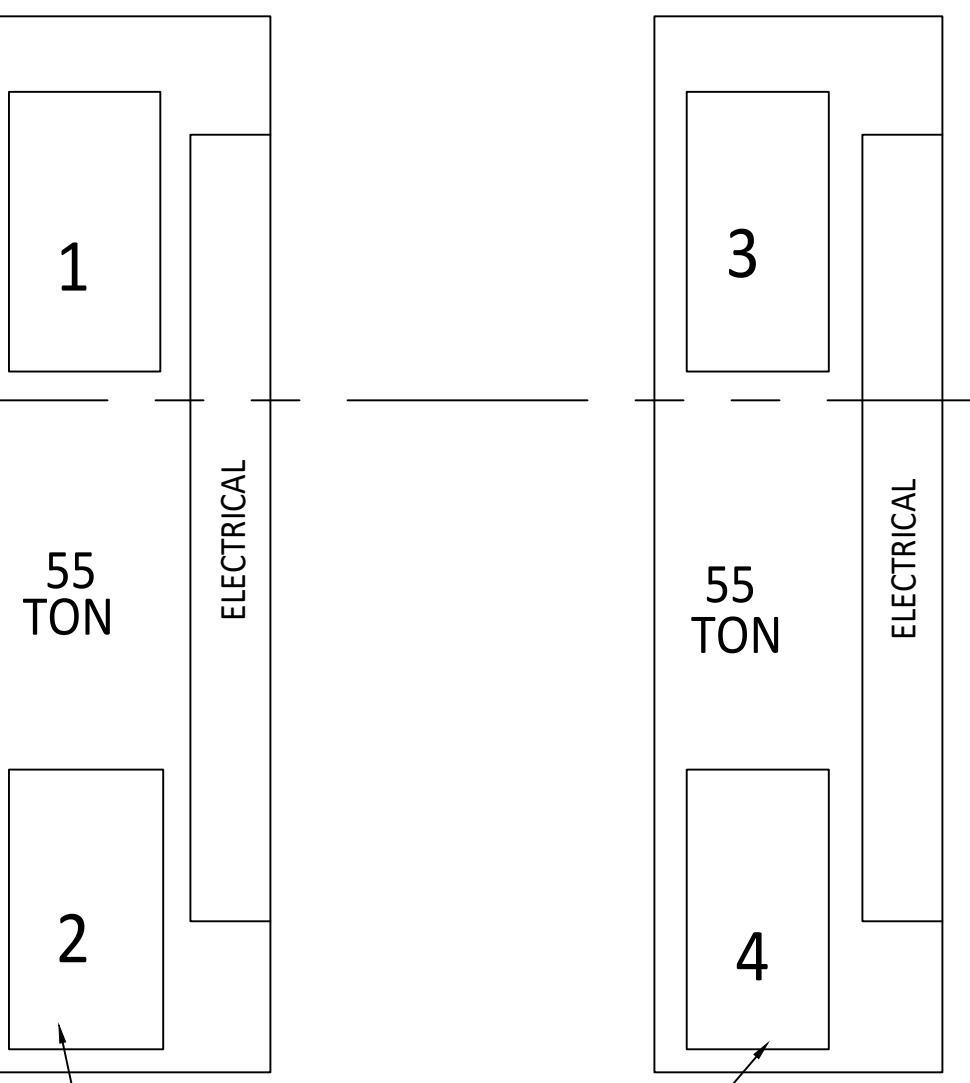
PROJECT
WALTHAM VETERAN'S RINK
WALTHAM, MA
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS

DRAWING TITLE
DEMOLITION PLAN

ELECTRICAL ROOM

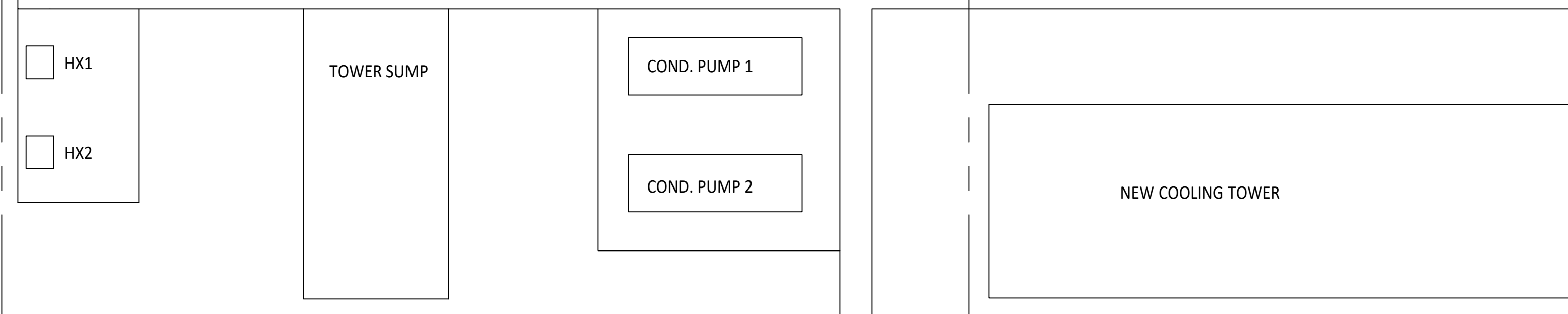
NEW GLYCOL PUMPS

MECH. ROOM



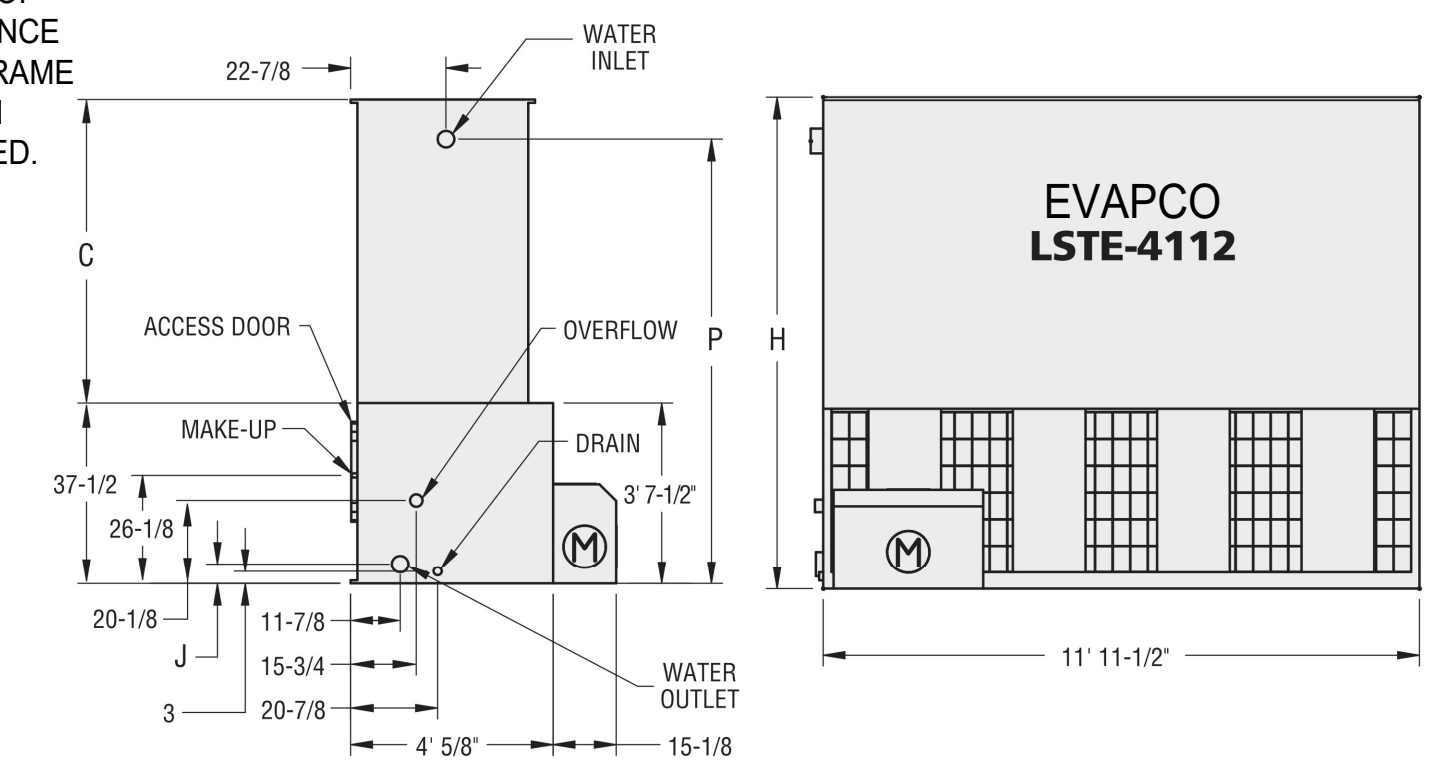
NEW CHILLER SKIDS

NEW MECHANICAL ROOM
SCALE: N.T.S



ENGINEERING DATA & DIMENSIONS

AT CONTRACTOR'S OPTION, A SUBSTITUTE COOLING TOWER OF EQUAL OR GREATER PERFORMANCE MAY BE USED. EXISTING STEEL FRAME MAY REQUIRE MODIFICATION IF A SUBSTITUTE TOWER IS USED.



SMALL CENTRIFUGAL FAN MODELS

LSTE-4112

MODEL NO.	WEIGHT (LBS.)		NO. FANS	FAN MOTOR HP*	AIR FLOW CFM	DIMENSIONS				CONNECTIONS (IN.)				
	SHIPPING	OPERATING				H	P	C	J	WATER IN	WATER OUT	MAKE UP	DRAIN	OVER FLOW
LSTE-4112	2,930	4,240	4	10	24,400	8' 10-3/8"	7' 11-7/8"	5' 2-7/8"	6"	6"	6"	1"	2"	3"

- NOTES:
1. An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
 2. Connections smaller than 6" are MPT. Connections 6" or larger are Beveled For Weld/Grooved for mechanical coupling (BFW/Grooved).
 3. Do not use catalog drawings for certified prints. Dimensions are subject to change.
- * For external static pressure up to 1/2", use next size fan motor.

PAGE 4 OF 12

PROJECT
WALTHAM VETERAN'S RINK
WALTHAM, MA
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS

DRAWING TITLE
NEW EQUIPMENT LAYOUT

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85 Westen Avenue
Essex, MA 01929

A' A B C D E F G H I J K L

6
5
4
3
2
1

REMOVE EXISTING TRANSLUCENT FIBERGLASS PANEL(S) (KALWALL) TO ALLOW FOR SUPPLY/RETURN DUCTS. INFILL OPENING AROUND NEW DUCTWORK WITH INSULATED METAL PANEL. PROVIDE FLASHING AND COUNTER FLASHING FOR A WEATHER TIGHT SEAL.

NEW 5,000 CFM DESICCANT DEHUMIDIFIER. CONTRACTOR TO PROVIDE ALL STRUCTURAL STEEL, 2 COATS OF RUST PROTECTANT PRIMER, FOR ALL STEEL, ROOF PENETRATIONS, POWER AND CONTROL CONDUIT, ANY NEEDED DISCONNECTS, AND UP TO 400 MBH GAS LINE FROM MECHANICAL ROOM TO DEHUMIDIFIER UNIT.

SEE 1 ON SHEET 5

FIELD VERIFY LOCATION FROM STRUCTURAL PLANS

SEE 2A ON SHEET 5

EXTERNAL DUCTWORK TO BE INSULATED TO PREVENT CONDENSATION.

RINK AIR MANAGEMENT UNIT 6' FROM FLOOR

DEHUMIDIFIER CONTROL BOX

GAS METER

50'-0" [600"] NO VENTILATION SUPPLY

24" SPIRAL DUCTWORK

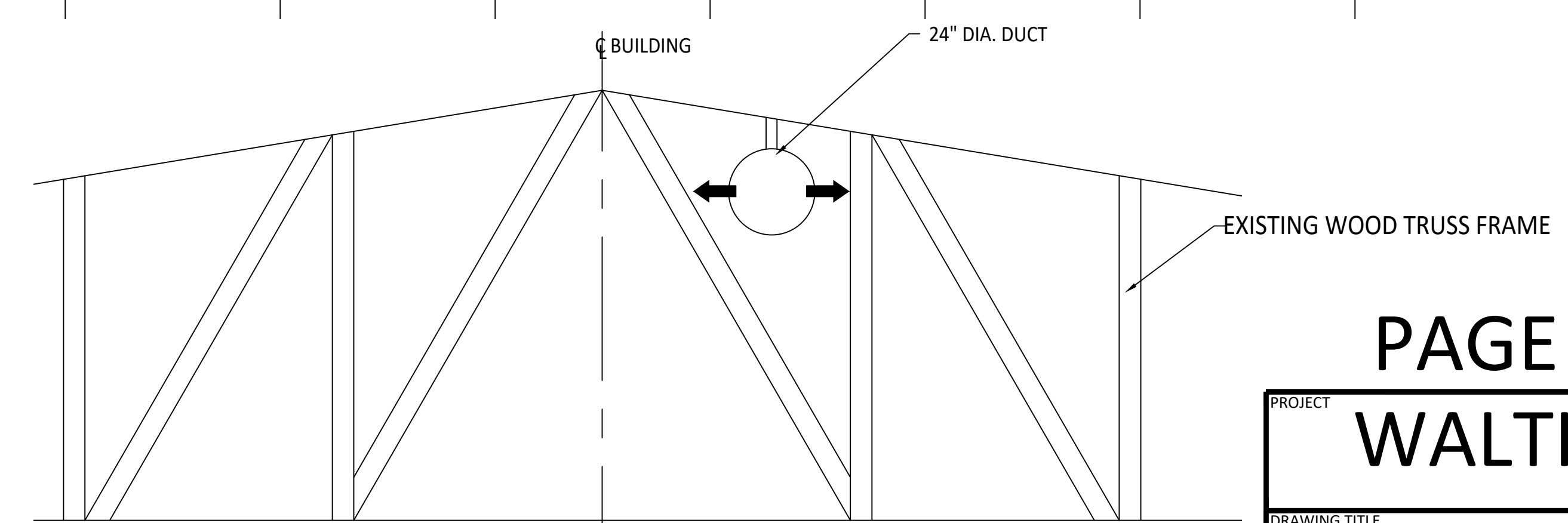
RETURN

LOW VELOCITY THROW

LOW VELOCITY THROW

NEW DEHUMIDIFIER LAYOUT

SCALE: $\frac{3}{32}" = 1'-0"$



CEILING AND DUCT CROSS SECTION A-A
SCALE: $\frac{3}{8}" = 1'-0"$

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Essex, MA 01929

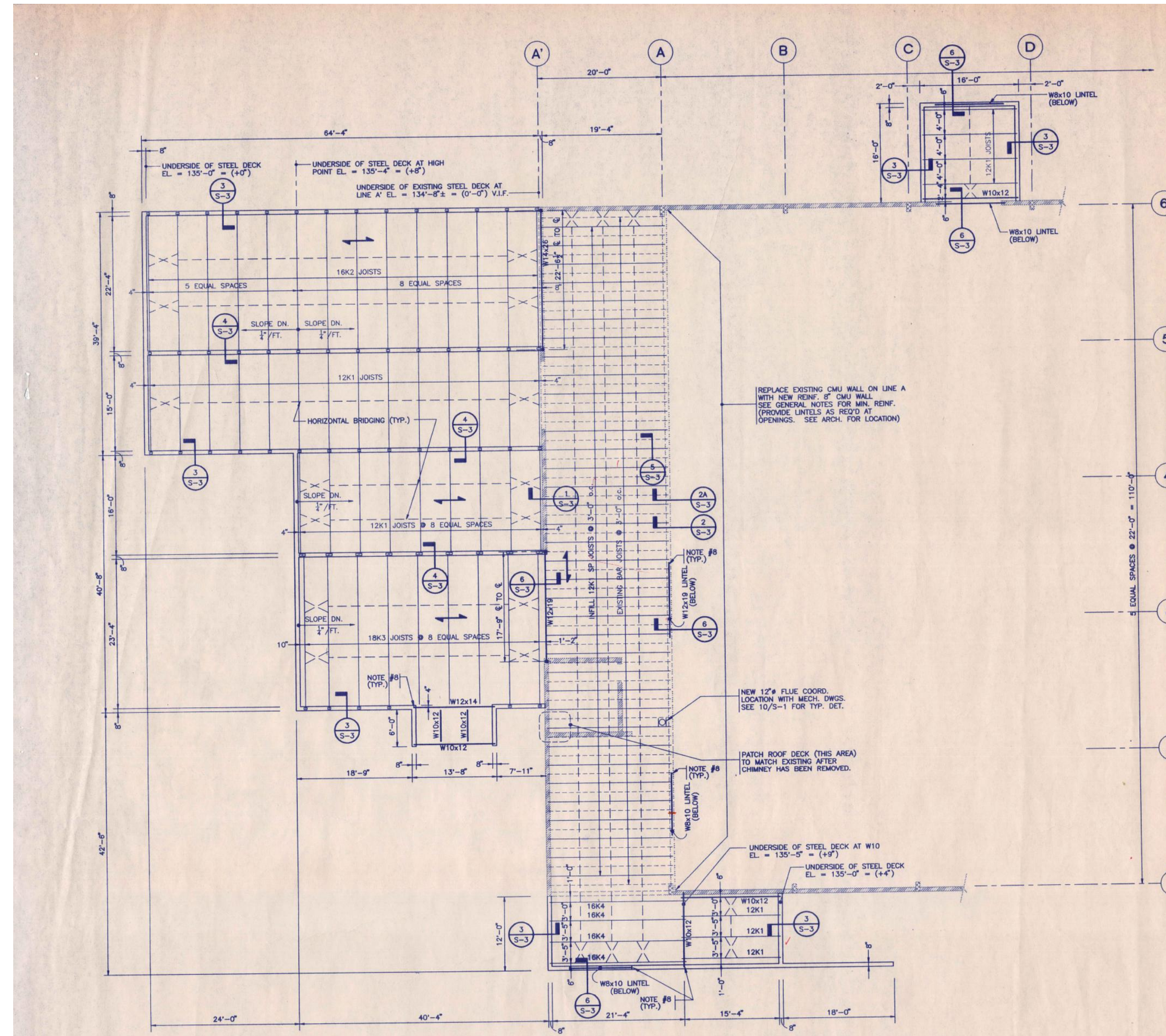
PAGE 5 OF 12

PROJECT
WALTHAM VETERAN'S RINK

REFRIGERATION AND VENTILATION IMPROVEMENTS

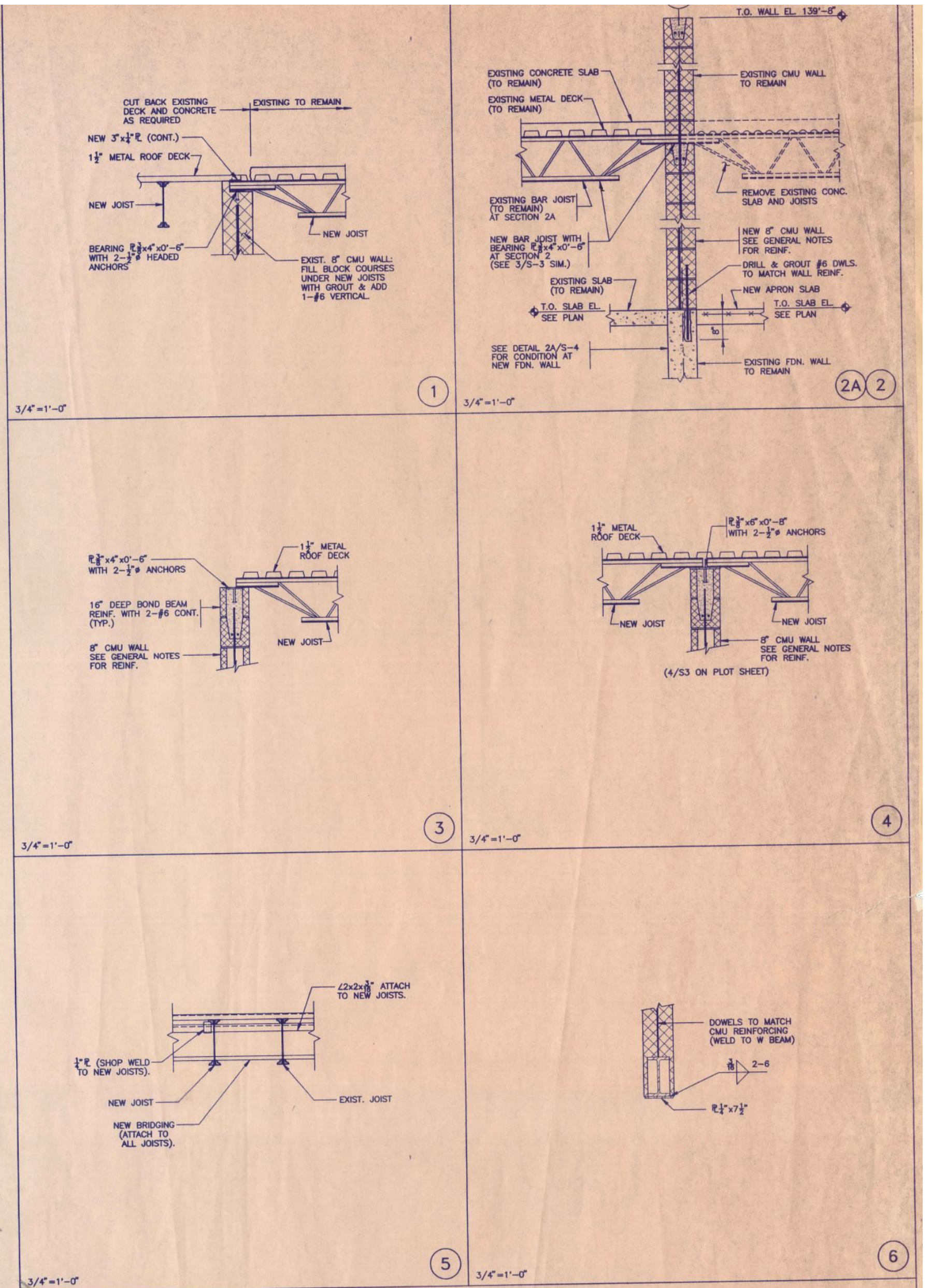
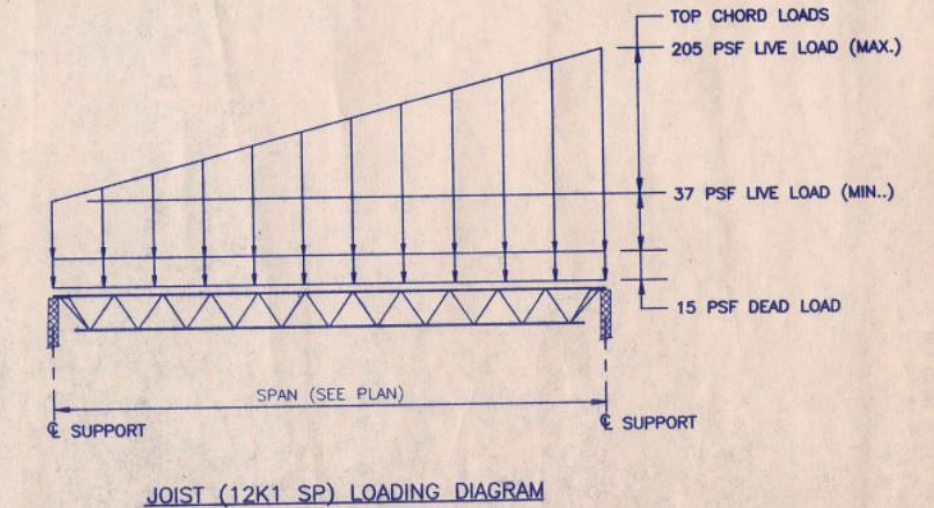
DRAWING TITLE

DEHUMIDIFIER LAYOUT



1 ROOF FRAMING PLAN
SCALE: 1/8" = 1'-0"

- NOTES:
- TOP OF STEEL (UNDERSIDE OF DECK) SHALL BE EL. 134'-0" UNLESS OTHERWISE INDICATED. THIS (E.O.-D.). ALL GRIDDERS SUPPORTING JOISTS TO BE 2" BELOW T.O.S. EL. INDICATED.
 - INDICATES SPAN DIRECTION OF 1 1/2" x 20" GAGE GALVANIZED TYPE "B" METAL ROOF DECK.
 - JOISTS SHALL BE DESIGNED FOR A NET UPLIFT LOAD OF 7 PSF (DUE TO WIND). PROVIDE ADDITIONAL BRIDGING AS REQUIRED.
 - (E) INDICATES EXISTING STRUCTURE.
 - ROOF FRAMING MUST BE ADJUSTED TO SUIT MECHANICAL UNITS TO BE INSTALLED. SIZE AND LOCATION OF MECHANICAL UNITS TO BE DETERMINED.
 - "* " INDICATES ASTM A572 GRADE 50 SHAPES.
 - "V.I.F." INDICATES ITEMS TO BE VERIFIED IN FIELD.
 - WIDEFLANGE SECTIONS MUST HAVE 6" MIN. BEARING ON CMU. CMU SUPPORTING WIDEFLANGE SECTIONS MUST HAVE 2-#6 VERT. x FULL HEIGHT OF WALL.



PROJECT NO. M035008.3.2 CONTRACT NO. DC1
RENOVATIONS AND ADDITIONS TO
VETERAN'S MEMORIAL RINK
THE COMMONWEALTH OF MASSACHUSETTS
DIVISION OF CAPITAL PLANNING AND OPERATIONS
OFFICE OF FACILITIES MANAGEMENT

ROOF FRAMING PLAN
AND DETAILS

SWANES MANE & MCKE ASSOC. ARCHITECTS DRAWING NO.
1000 MASSACHUSETTS AVE. CAMBRIDGE, MA 02139
PROJAS ASSOCIATES, INC. CONSULTANTS
285 SUMMER STREET BOSTON, MA 02210
DRAWING HAS BEEN: SCALE: 1/8" = 1'-0"
TRACED DATE: OCTOBER 23, 1998
CHECKED JDC

CJL Engineering
232 Horner Street
Johnstown, PA 15902

Southgate Consulting
85 Westen Avenue
Essex, MA 01929

PAGE 6 OF 12

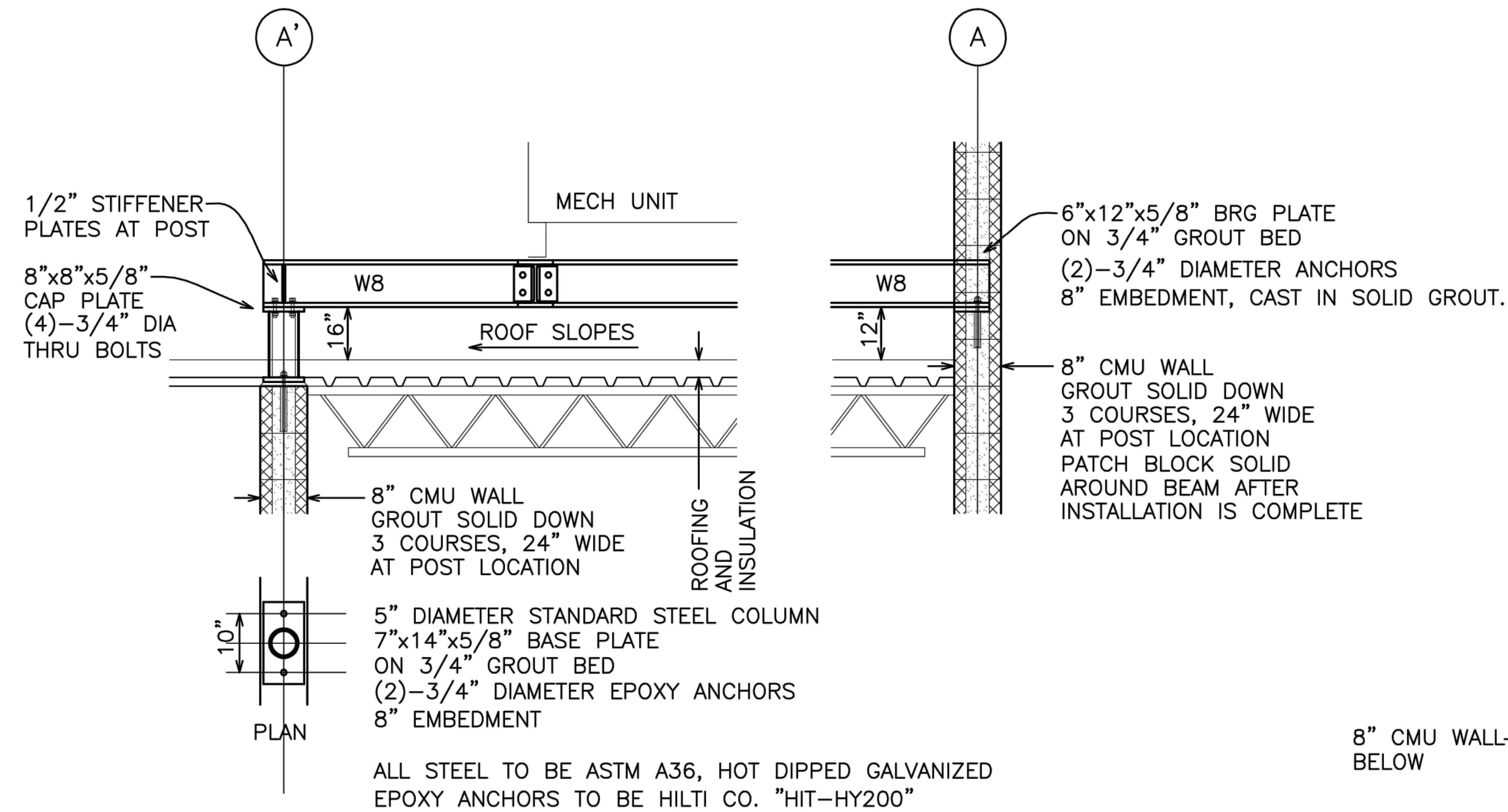
WALTHAM VETERAN'S RINK
WALTHAM, MA
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS

EXISTING ROOF FRAMING

Michael E. Waterman, PE. 
 STRUCTURAL ENGINEERING

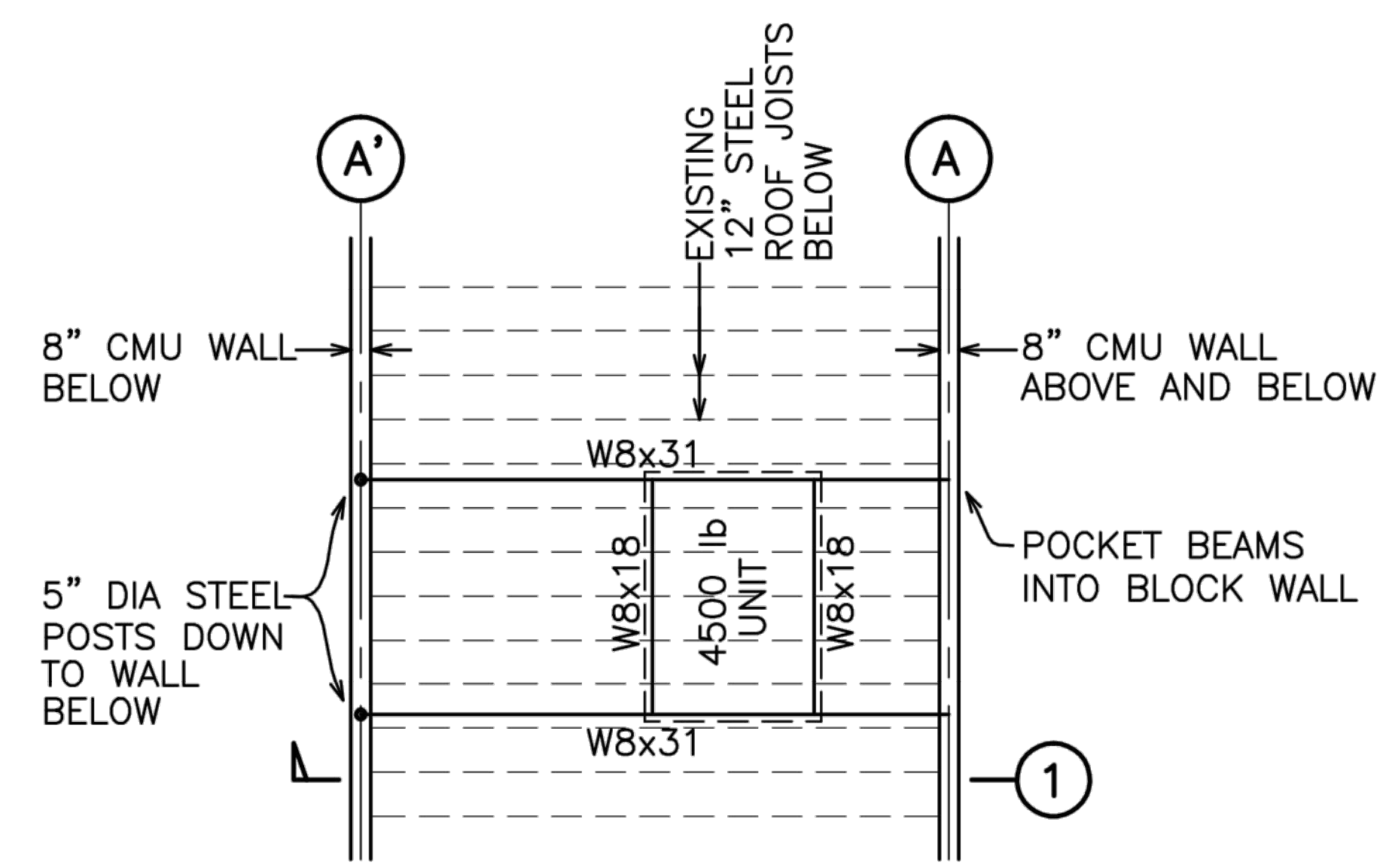
www.michaelwaterman.com

Project:	Veterans Rink Mechanical Unit Support
Location:	Waltham, MA
Description:	Unit Support Framing
Date:	March 15, 2017
Sheet:	SSK-1



1 SECTION THRU MECHANICAL UNIT SUPPORT
 SCALE: 1/2"=1'-0"

NOTE:
 REMOVE EXISTING BALLAST ROOFING MATERIAL AND INSULATION AT EACH LOCATION. CUT DECK ONLY ENOUGH TO PERFORM WORK. RE-INSULATE, INSTALL ROUND "DEK-TITE" FLASHING AND RESTORE ROOFING AND BALLAST.



ROOF PLAN
 SCALE: 1/8"=1'-0"

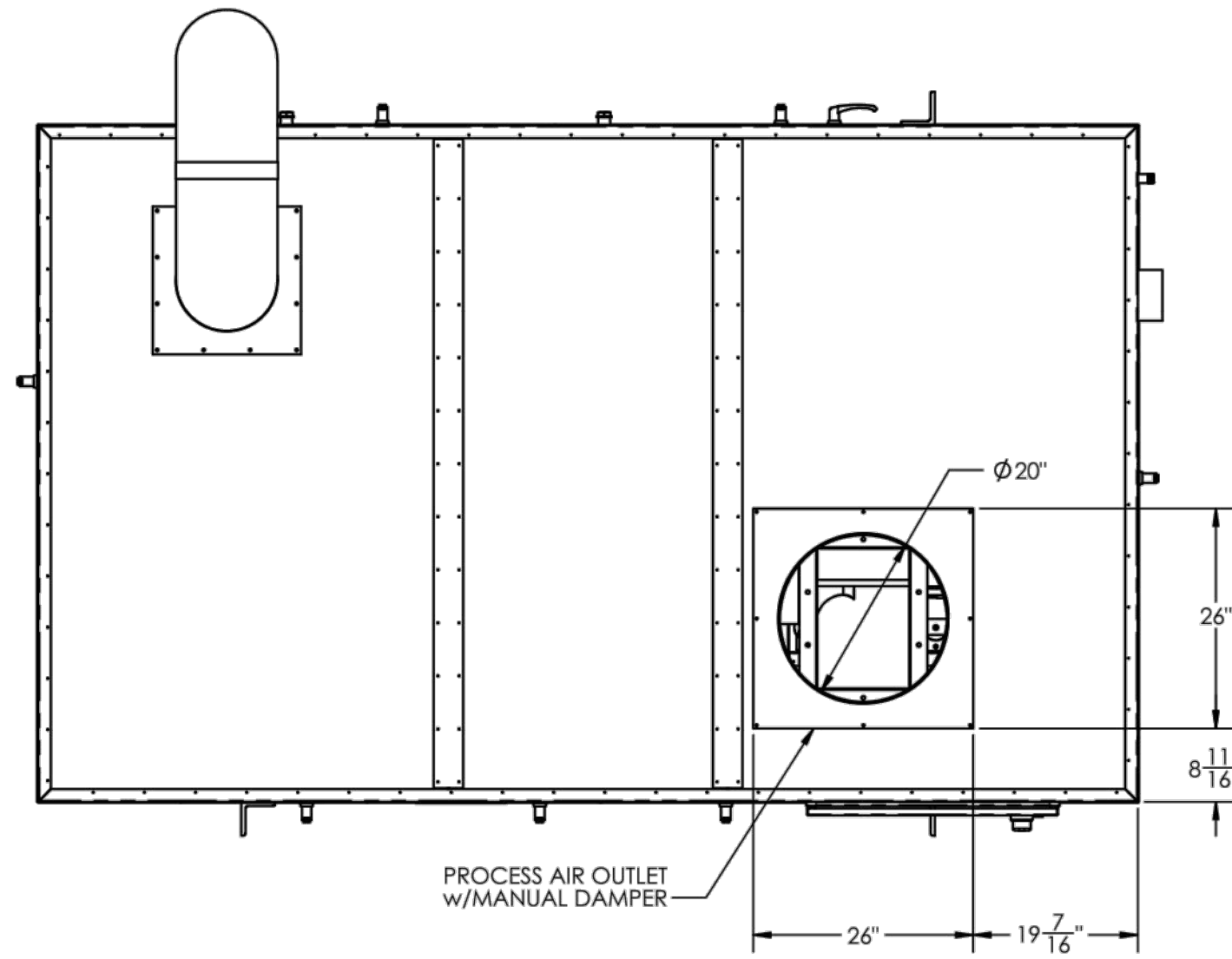
CJL Engineering
 232 Horner Street
 Johnstown, PA 15902
Southgate Consulting
 85 Westen Avenue
 Essex, MA 01929

PAGE 7 OF 12

PROJECT	WALTHAM VETERAN'S RINK <small>WALTHAM, MA REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS</small>
DRAWING TITLE	STEEL FRAME AT DEHUM ROOF SUPPORT

NOTES :

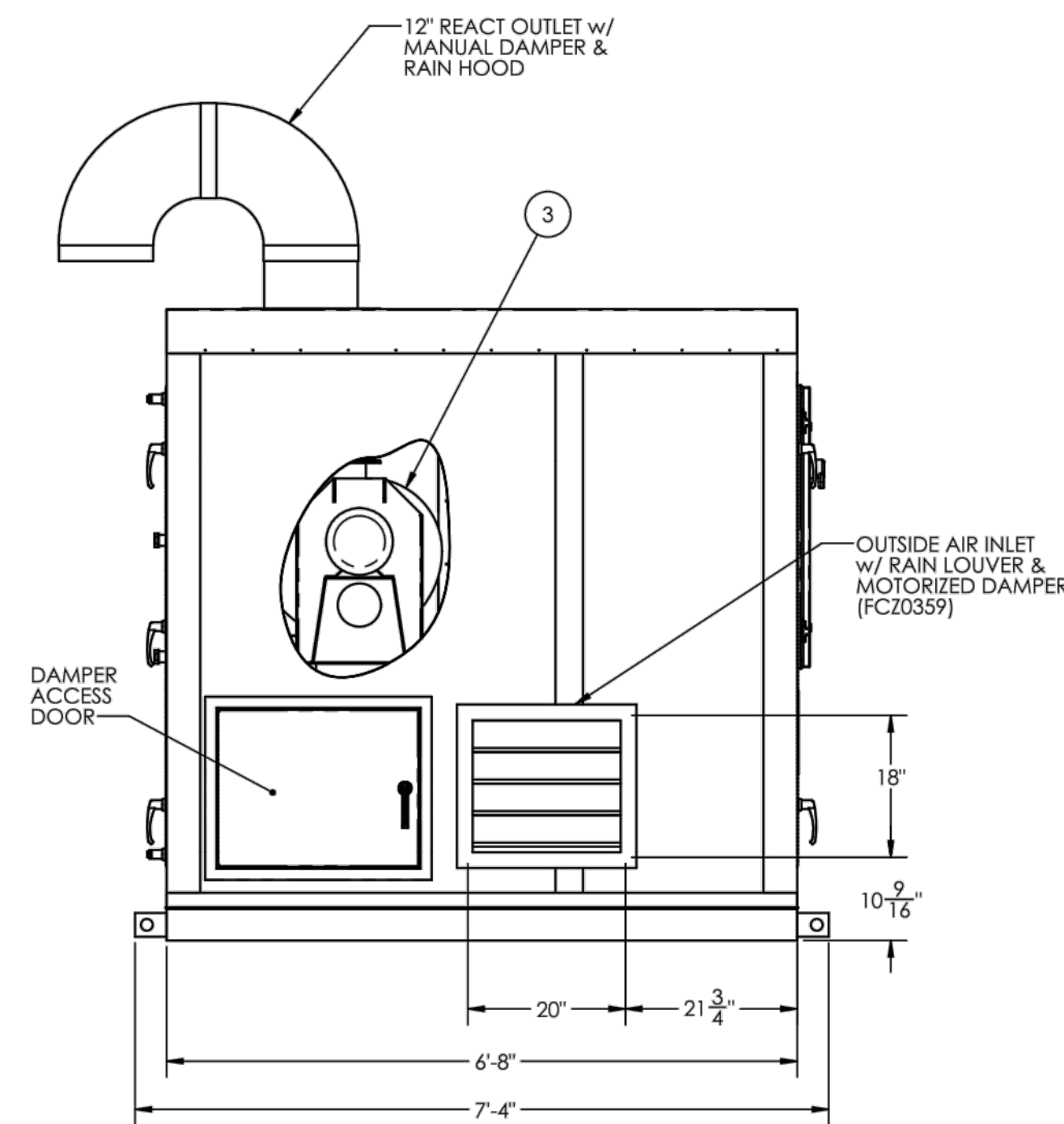
- 1) AN OBSERVATION WINDOW IS PROVIDED FOR VISUAL INSPECTION OF ROTATING DESICCANT ROTOR.
- 2) ALL FILTERS TO BE EASILY REMOVABLE BY MEANS OF ACCESS PANELS, FOR CLEANING OR REPLACEMENT.
- 3) UNLESS OTHERWISE NOTED, PROVIDE 40" CLEARANCE AROUND THE ENTIRE UNIT FOR SERVICE. EXCEPTION: PROVIDE 48" CLEARANCE FOR ACCESS TO CONTROL PANEL ENCLOSURE.
- 4) UNIT IS SUITABLE FOR OUTDOOR INSTALLATION.
- 5) PROCESS SIDE OF UNIT AND ASSOCIATED DUCTWORK TO BE METAL INSULATED PANEL CONSTRUCTION, 2" POLYISO/ POLYURETHANE INSULATION EXPANDED-IN-PLACE WITH EMBOSSED ALUMINUM EXTERIOR AND SMOOTH SURFACE ALUMINUM INTERIOR. NO-THRU-METAL DESIGN.
- 6) REACTIVATION SIDE OF UNIT AND ASSOCIATED DUCTWORK TO BE INSULATED WITH 1" THICK FOIL FACED FIBERGLASS INSULATION. INSULATION FOIL FACE IS EXPOSED TO REACTIVATION AIR STREAM.
- 7) THE HEIGHT FROM THE BASE OF THE BRY-AIR SKID TO THE SUPPLIED DISCONNECT SWITCH IS SHOWN ON THIS DRAWING. THE PARTY RESPONSIBLE FOR APPROVAL OF THESE DRAWINGS MUST VERIFY HEIGHT IS ACCEPTABLE WITH LOCAL CODES AND BUILDING AUTHORITIES. HEIGHT SHOWN DOES NOT TAKE INTO CONSIDERATION IF THE EQUIPMENT WILL BE INSTALLED ON A PAD OR PLATFORM.
- 8) EQUIPMENT MUST BE SUPPORTED AT A MINIMUM UNDER EACH LIFTING EYE TO PREVENT EXCESSIVE BOWING OF THE UNIT BASE.



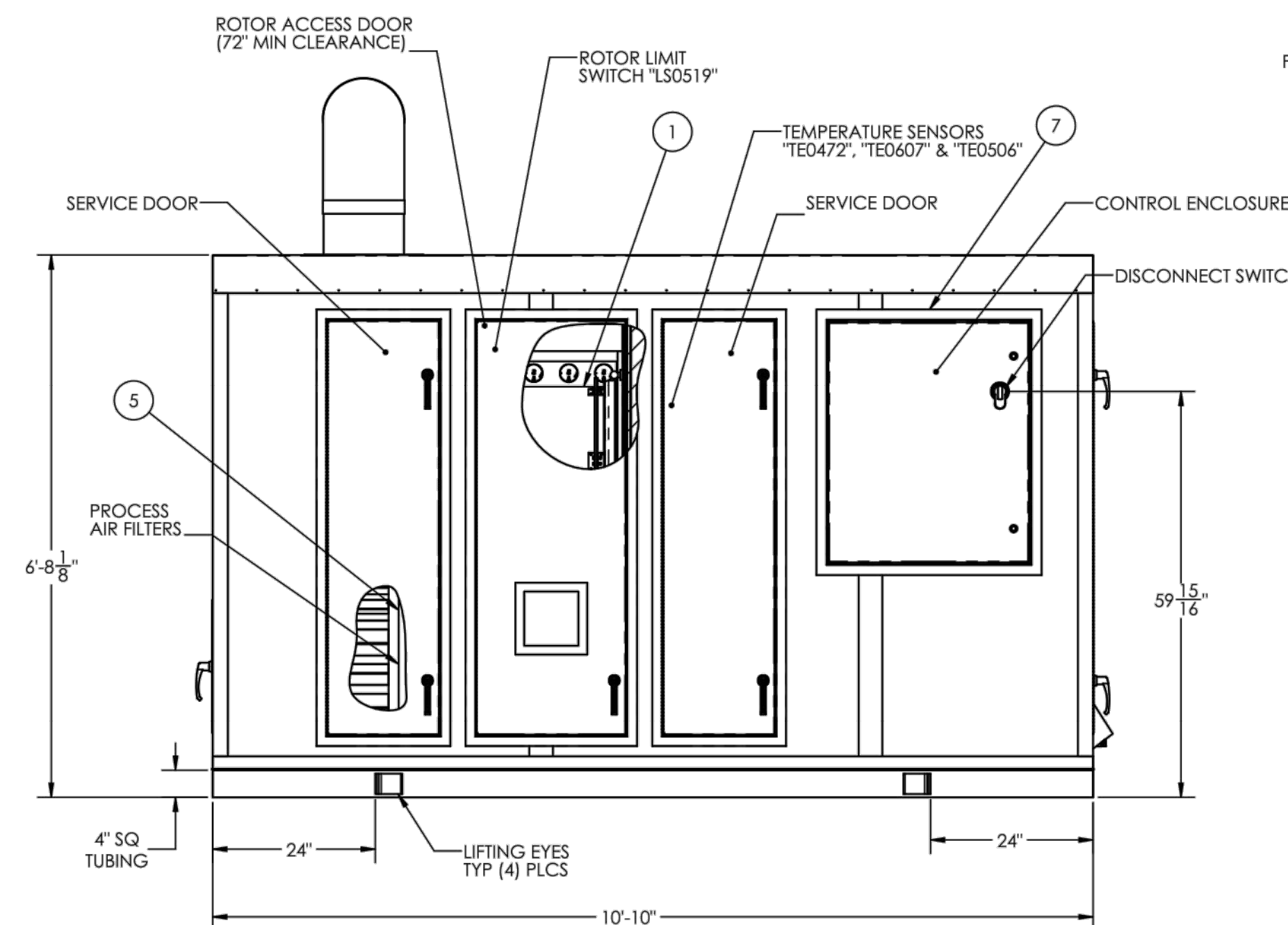
PLAN VIEW

COMPONENT LIST		
ITEM	QUAN	MODEL
11		FB-50-G4 INDUSTRIAL DEHUMIDIFIER UNIT CONTAINS ONE DESICCANT ROTOR (P/N 36812) NOMINAL SYSTEM CFM : 5000 NOMINAL RETURN AIR CFM : 4000 NOMINAL MAKE-UP AIR CFM : 5000 CAPABLE NOMINAL REACTIVATION CFM : 1250 DESICCANT ROTOR SPLIT (270/90/0), ROTOR SPEED 8 RPH (7MIN-30SEC/REV) ROTOR DRIVE MOTOR, 1/20 HP, 7.5 RPM, 230/3/60 (P/N 37255)
2	1	PROCESS AIR FAN (P/N 215122-A020) 16 3/16" WHEEL, SQ BACKWARD INCLINED, ARR. 4 (DIRECT DRIVE) CW/UB ROTATION AND DISCHARGE, 95% WIDTH 5,000 CFM @ 5.22" TSP (1.50" E.S.P.), 3,262 RPM @ 8.5 BHP, SET VIA VFD 10 HP MOTOR, 215 T FRAME, 3,450 RPM, TEFC, 460/3/60
3	1	REACTIVATION AIR FAN (P/N 215122-A021) 12 1/4" WHEEL, HD BACKWARD INCLINED, ARR. 4 (DIRECT DRIVE) CW/UB ROTATION AND DISCHARGE, 60% WIDTH 1250 CFM @ 5.23" TSP (0.75" E.S.P.), 3,450 RPM @ 1.75 BHP 2 HP MOTOR, 145T FRAME, 3,450 RPM, TEFC, 460/3/60
4	1	REACTIVATION HEAT SOURCE: DIRECT FIRED NATURAL GAS 12" BURNER, 270 CFH, 276,750 BTUH
5	5	PROCESS INLET AIR FILTER : 12" x 24" x 2" (P/N 27215) - DISPOSABLE 30% EFF
6	1	REACTIVATION INLET AIR FILTER : 24" x 24" x 2" (P/N 30277) - DISPOSABLE 45% EFF, HIGH TEMPERATURE
7	1	MAIN CONTROL PANEL ENCLOSURE 36" x 30" x 8" NEMA TYPE 4, UL APPROVED

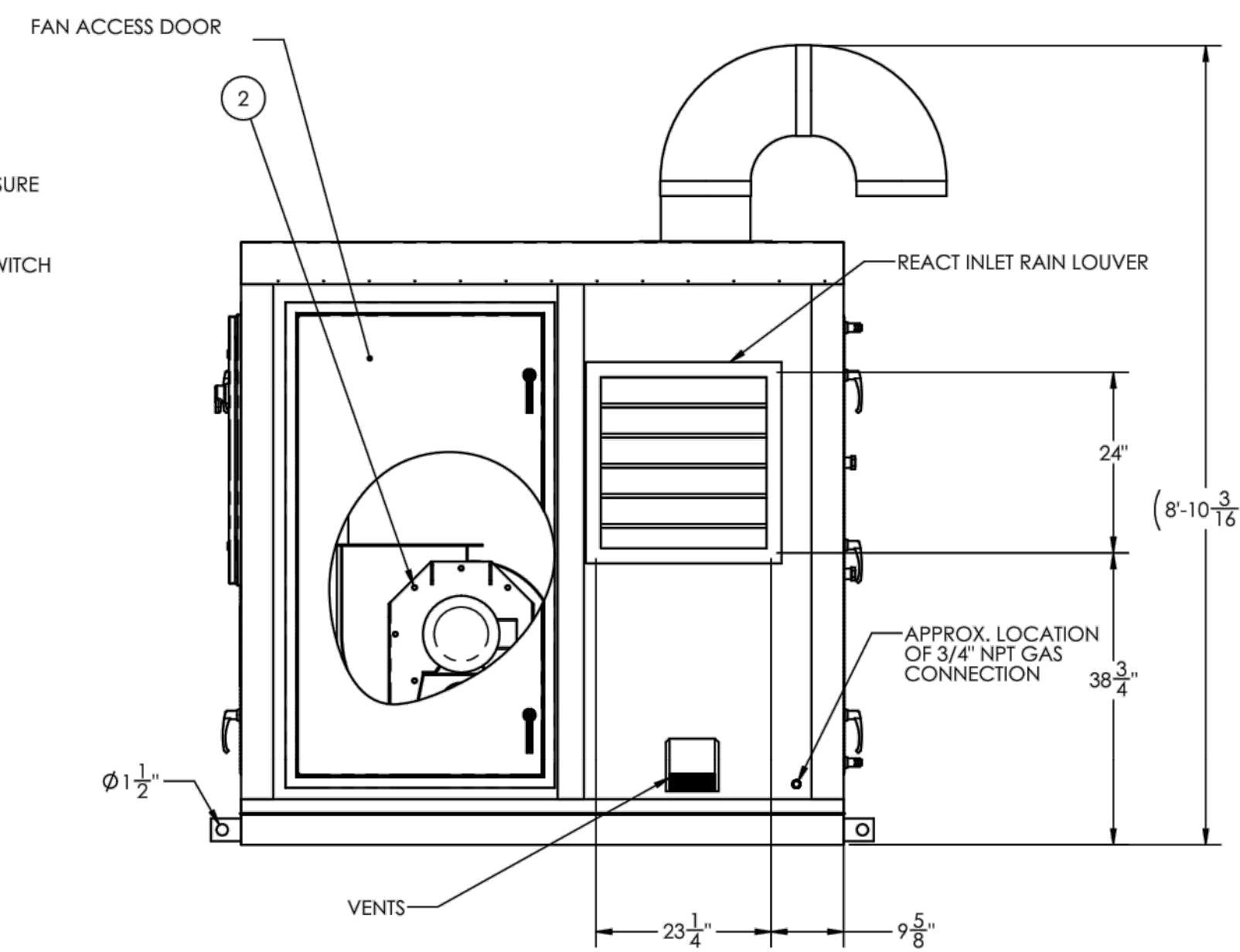
ESTIMATED EQUIPMENT WEIGHT 3,800 LBS



LEFT ELEVATION VIEW



FRONT ELEVATION VIEW



RIGHT ELEVATION VIEW

*SUGGESTED DEHUMIDIFIER UNIT.
ALTERNATIVE UNITS SHOULD BE
OF EQUAL OR BETTER PERFORMANCE.
STEEL DUNNAGE MAY NEED TO BE
MODIFIED TO SUIT ACTUAL UNIT.

DRAWN: JH		DATE: 11/09/16	TITLE: Waltham Ice Arena	
CHECKED:			SCALE: 1:16 WEIGHT: SHEET 1 OF 2	
UNLESS OTHERWISE SPECIFIED:		DIMENSIONS ARE IN INCHES		
FRACTIONAL 1/16		TOLERANCES		
ANGULAR 30 DEG		SIZE DWG. NO. REV		
TWO PLACE DECIMAL # 0.00"		D		
THREE PLACE DECIMAL # 0.000"		B		

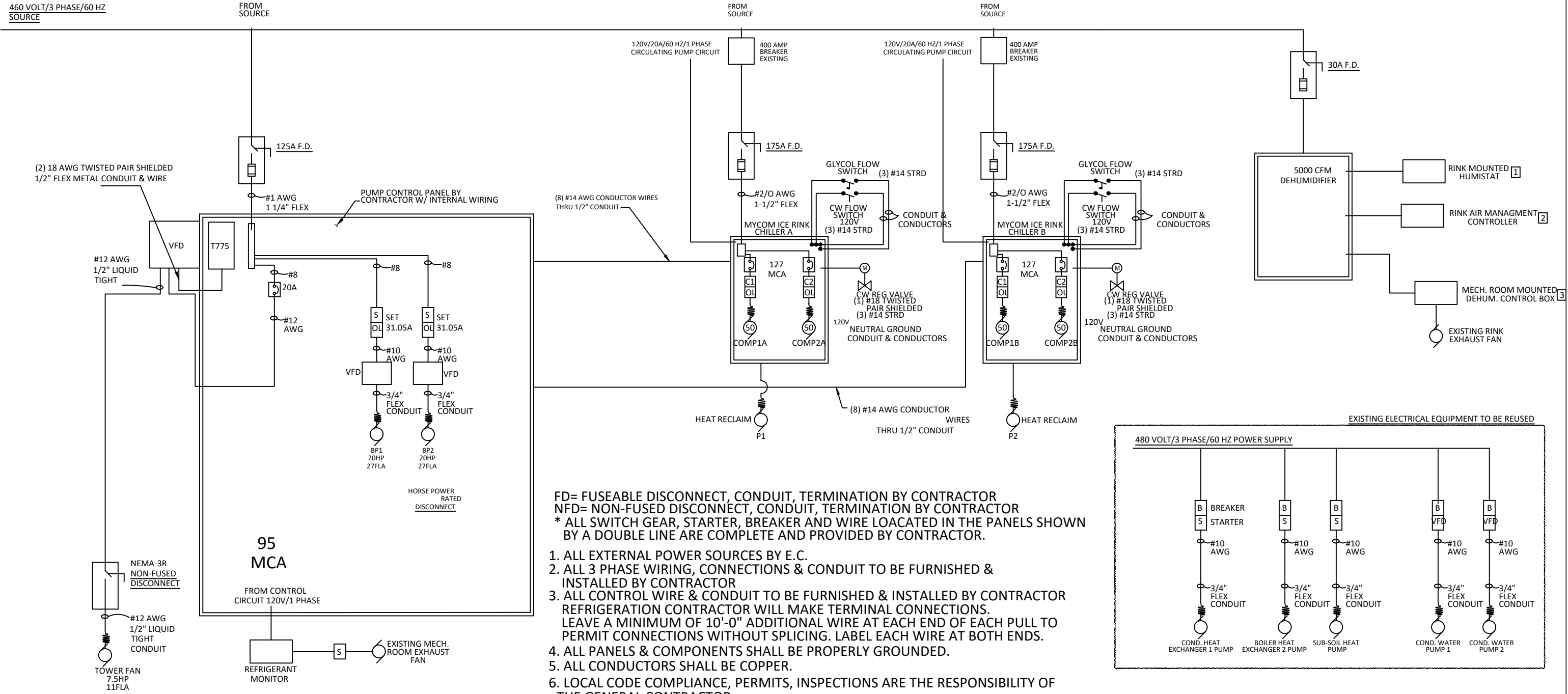
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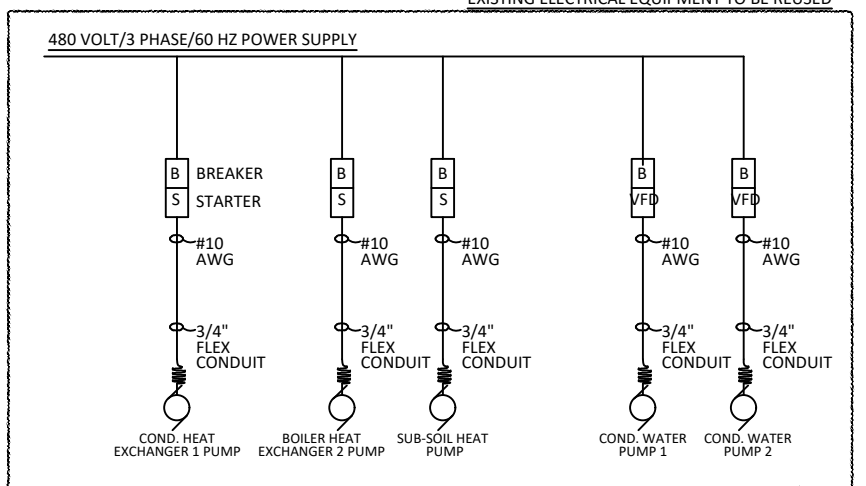
PROJECT: **WALTHAM VETERAN'S RINK**
WALTHAM, MA
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS
DRAWING TITLE: **DEHUMIDIFIER DETAILS**

460 VOLT/3 PHASE/60 HZ SOURCE

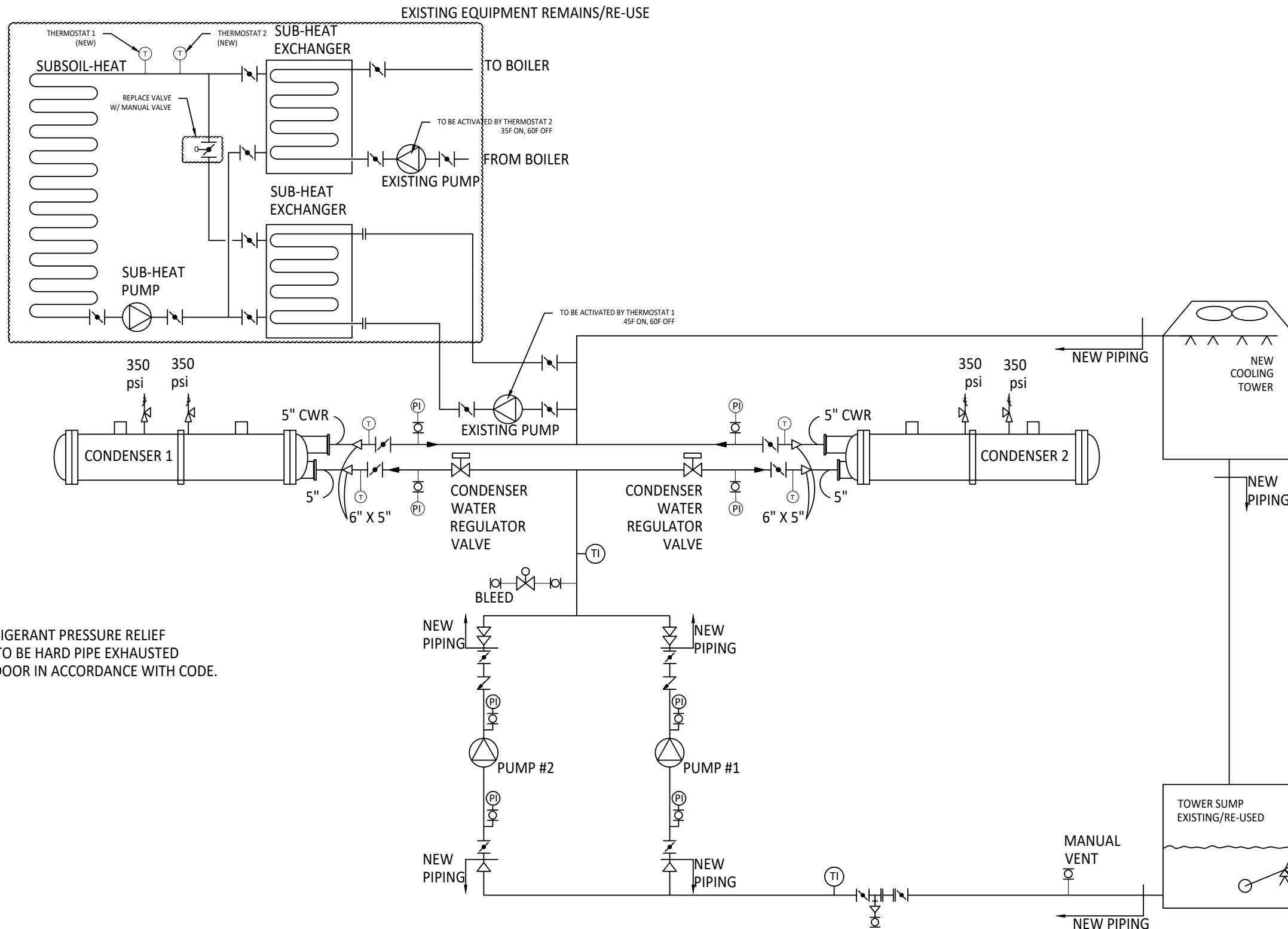


FD= FUSEABLE DISCONNECT, CONDUIT, TERMINATION BY CONTRACTOR
 NFD= NON-FUSED DISCONNECT, CONDUIT, TERMINATION BY CONTRACTOR
 * ALL SWITCH GEAR, STARTER, BREAKER AND WIRE LOACATED IN THE PANELS SHOWN BY A DOUBLE LINE ARE COMPLETE AND PROVIDED BY CONTRACTOR.

1. ALL EXTERNAL POWER SOURCES BY E.C.
2. ALL 3 PHASE WIRING, CONNECTIONS & CONDUIT TO BE FURNISHED & INSTALLED BY CONTRACTOR
3. ALL CONTROL WIRE & CONDUIT TO BE FURNISHED & INSTALLED BY CONTRACTOR REFRIGERATION CONTRACTOR WILL MAKE TERMINAL CONNECTIONS. LEAVE A MINIMUM OF 10'-0" ADDITIONAL WIRE AT EACH END OF EACH PULL TO PERMIT CONNECTIONS WITHOUT SPLICING. LABEL EACH WIRE AT BOTH ENDS.
4. ALL PANELS & COMPONENTS SHALL BE PROPERLY GROUNDED.
5. ALL CONDUCTORS SHALL BE COPPER.
6. LOCAL CODE COMPLIANCE, PERMITS, INSPECTIONS ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
7. ELECTRICAL INSTALLATION BY CONTRACTOR SHALL COMMENCE IMMEDIATELY AFTER PLACEMENT OF CHILLER AND PUMP SKID. A FUNCTIONAL SERVICE WILL BE REQUIRED FOR CHARGING & TESTING THE SYSTEM.
8. SEE SPECIFICATIONS FOR SEQUENCING OF OPERATIONS.



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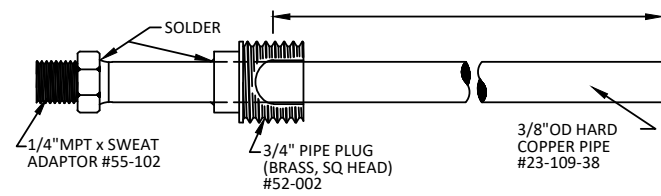
* ALL REFRIGERANT PRESSURE RELIEF VALVES TO BE HARD PIPE EXHAUSTED TO OUTDOOR IN ACCORDANCE WITH CODE.

PAGE 10 OF 12

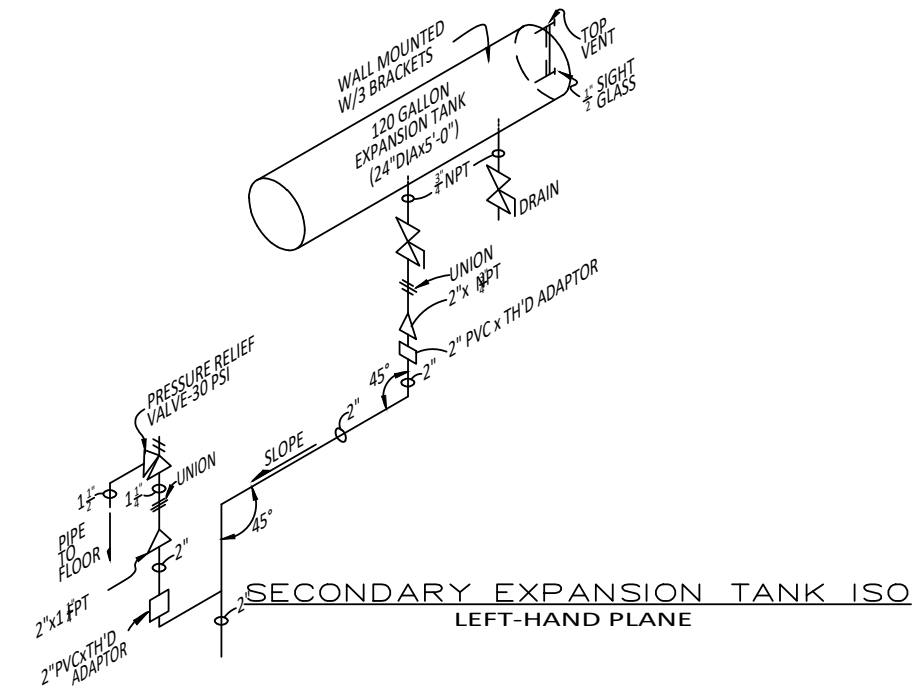
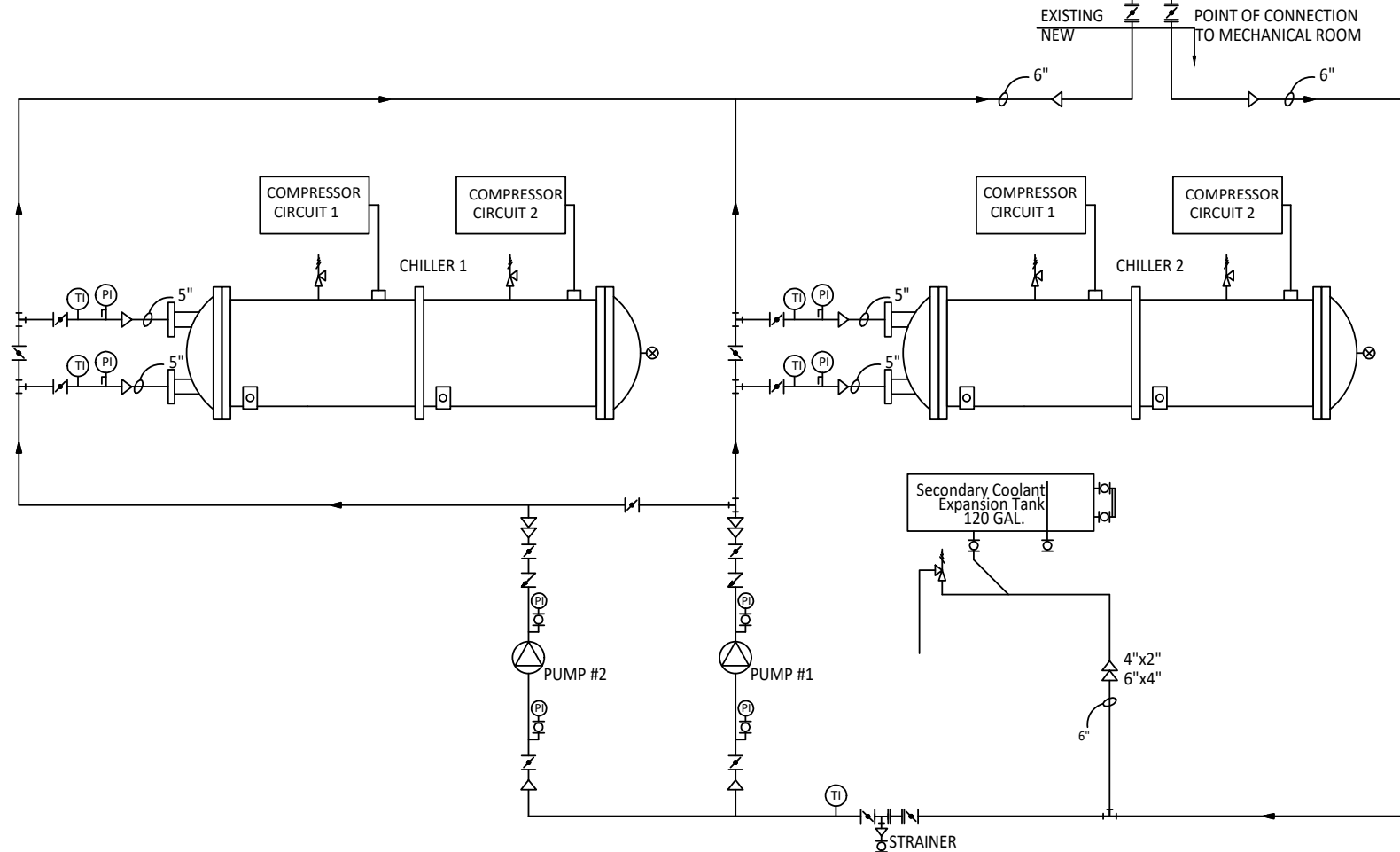
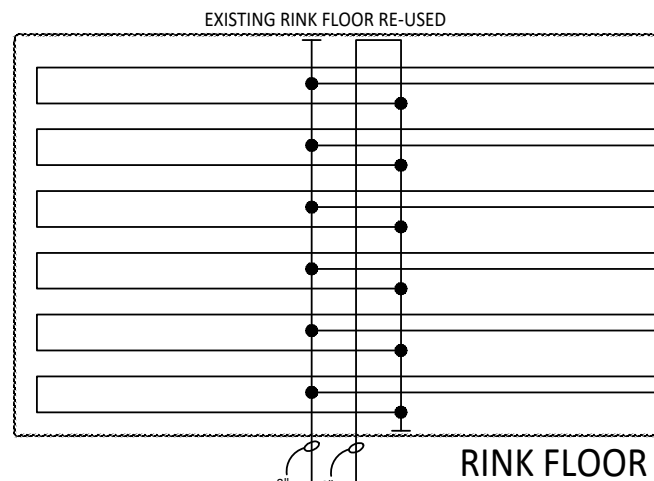
PROJECT	WALTHAM VETERAN'S RINK
	WALTHAM, MA REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS
DRAWING TITLE	CONDENSER WATER

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ADDITIONAL MAT'L (NOT SHOWN)
(1) 1/4" FPT BALL VALVE



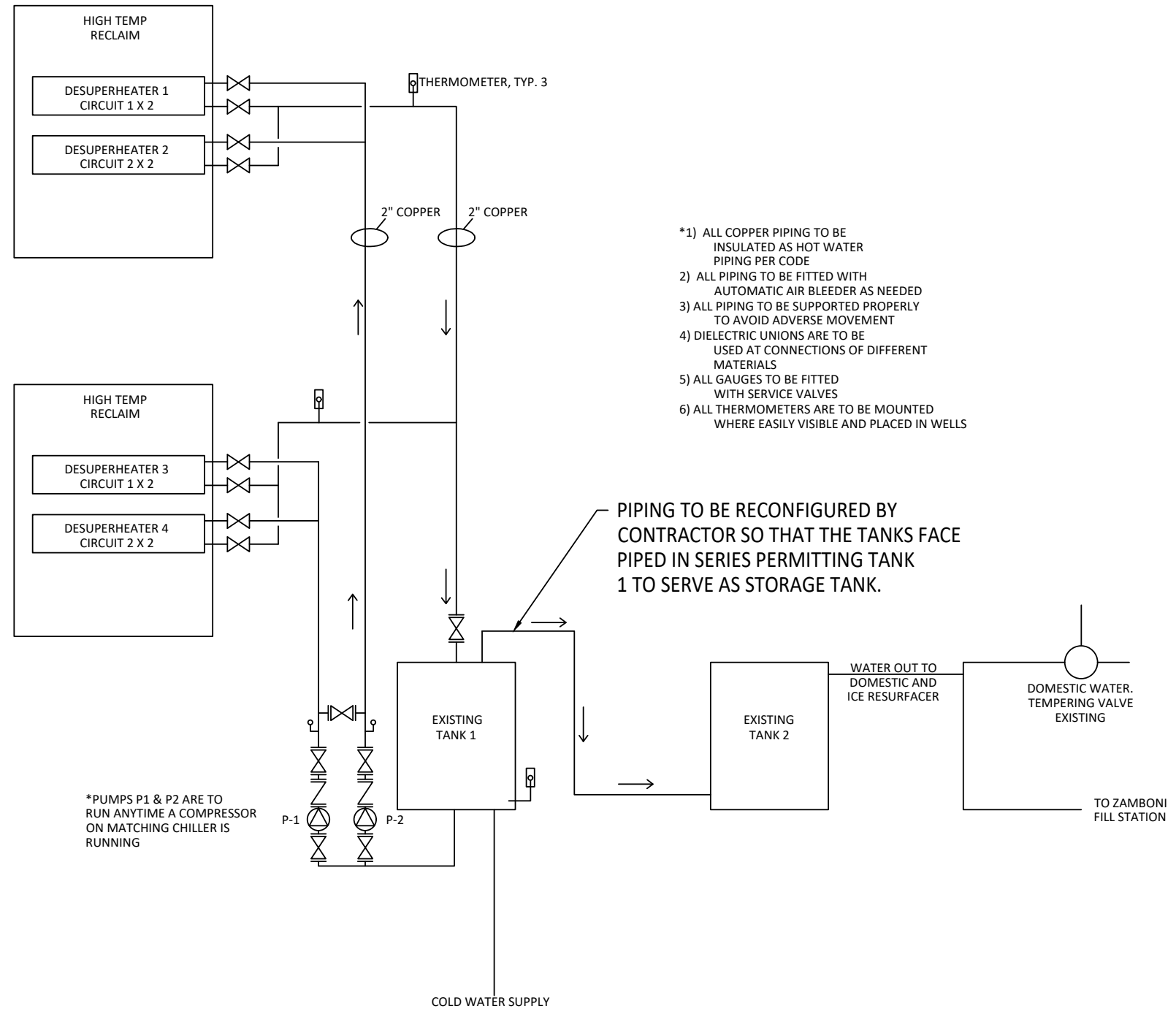
BREATHER
120 GAL (24" DIA) EXPANSION TANK



* ALL REFRIGERANT PRESSURE RELIEF VALVES TO BE HARD PIPE EXHAUSTED TO OUTDOOR IN ACCORDANCE WITH CODE.

- NOTES:**
- 1) BRINE PUMP SCHEDULE:
BP2 -- 20 HP; 360 GPM @ 120 FT. HD.; ON VFD.
BP1 -- 20 HP; 360 GPM @ 120 FT. HD.; ON VFD.
 - 2) ALL SECONDARY PIPING & FITTINGS SHALL BE SCH 80 PVC.
 - 3) LOCATE PIPE HANGERS MINIMUM 6'-0" ON CENTER. PIPES TO BE INSTALLED PLUMB & LEVEL, EXCEPT WHERE NOTED OTHERWISE.
 - 4) CHECK VALVES TO BE SILENT (NON-SLAM) TYPE.
 - 5) INSULATE ALL PIPING, FITTINGS, VALVES, PUMP HOUSINGS, EXPANSION TANKS, ETC. WITH 3/4" TH'K ARMAFLEX INSULATION OR EQUAL. JOINTS & SEAMS TO BE SEALED WITH SUITABLE ADHESIVE SO AS TO CREATE A CONTINUOUS VAPOR BARRIER.
 - 6) PIPE HANGERS SHALL NOT BREAK INSULATION BARRIER.
 - 7) ONE INCH (1") MANUAL AIR VENT TO BE INSTALLED IN 6" DIA. STAND PIPE, MINIMUM 8" ABOVE VERTICAL DOWN LEGS IN PIPING, SO AS TO CREATE AN AIR COLLECTION POINT FOR VENTING.
 - 8) LOCATE EXPANSION TANK AS HIGHEST POINT IN SYSTEM.

<p>PAGE 11 OF 12</p> <p>WALTHAM VETERAN'S RINK</p> <p>REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS</p>	<p>CJL Engineering 232 Horner Street Johnstown, PA 15902</p>
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<p>GLYCOL LOOP</p>	



- *1) ALL COPPER PIPING TO BE INSULATED AS HOT WATER PIPING PER CODE
- 2) ALL PIPING TO BE FITTED WITH AUTOMATIC AIR BLEEDER AS NEEDED
- 3) ALL PIPING TO BE SUPPORTED PROPERLY TO AVOID ADVERSE MOVEMENT
- 4) DIELECTRIC UNIONS ARE TO BE USED AT CONNECTIONS OF DIFFERENT MATERIALS
- 5) ALL GAUGES TO BE FITTED WITH SERVICE VALVES
- 6) ALL THERMOMETERS ARE TO BE MOUNTED WHERE EASILY VISIBLE AND PLACED IN WELLS

*PUMPS P1 & P2 ARE TO RUN ANYTIME A COMPRESSOR ON MATCHING CHILLER IS RUNNING

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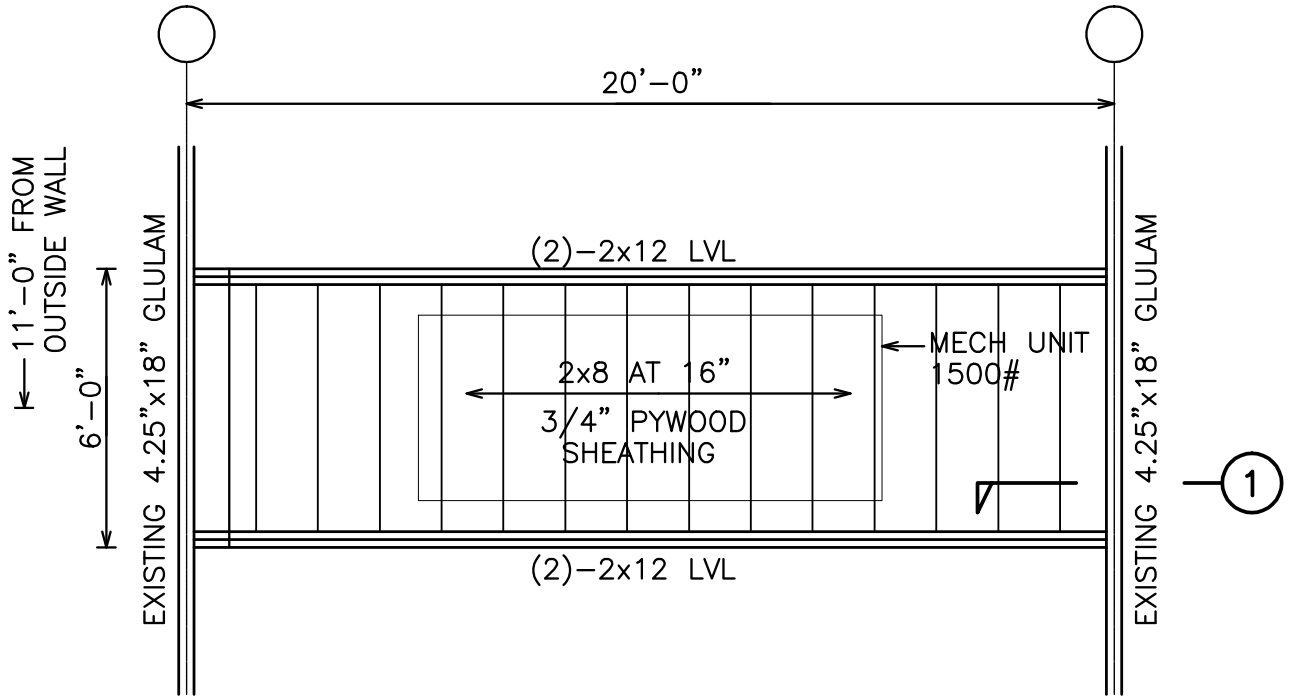
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PROJECT	WALTHAM VETERAN'S RINK
DRAWING TITLE	HEAT RECLAIM DIAGRAM

WALTHAM, MA
REFRIGERATION AND DEHUMIDIFICATION IMPROVEMENTS

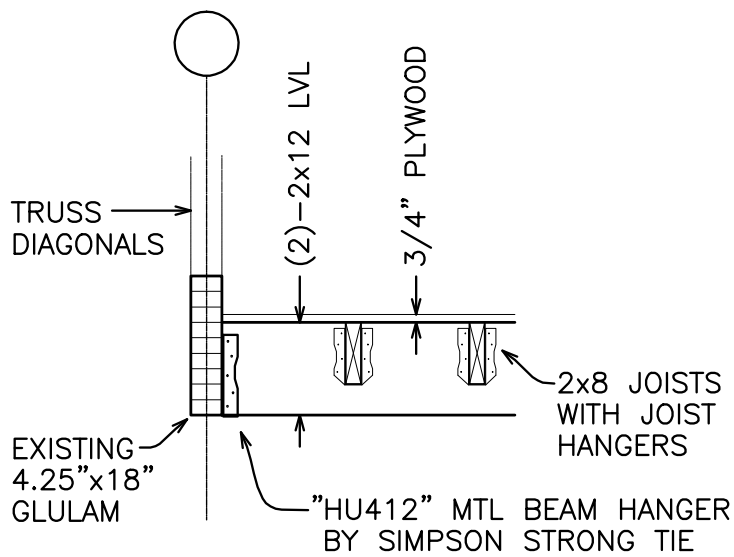


Project:	Waltham Rink
Location:	Waltham, MA
Description:	Mechanical Platform
Date:	August 24, 2017
Sheet:	SSK-3

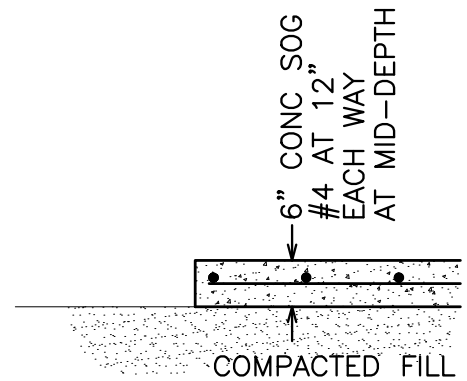


PLAN AT MECHANICAL UNIT PLATFORM

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



1 SECTION AT PLATFORM
 SCALE: 1/2"=1'-0"

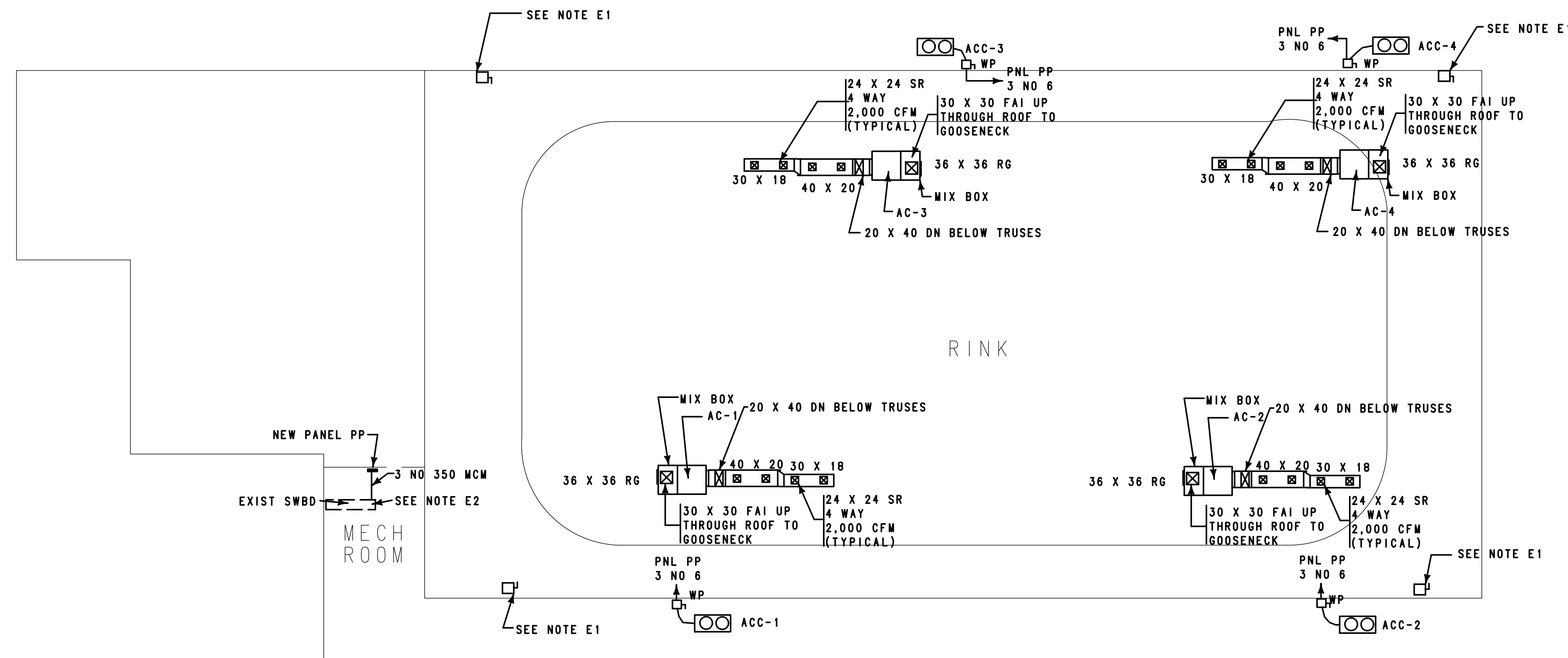


USE 4000 PSI CONCRETE
 AIR ENTRAINED

2 SECTION AT OUTSIDE PAD
 SCALE: 1/2"=1'-0"

ELECTRICAL NOTES

- E1 EXISTING 30 AMP, 480 VOLT, 3 PHASE FEEDER WITH A DISCONNECT SWITCH. REMOVE DISCONNECT SWITCH. ADD A JUNCTION BOX, EXTEND CONDUIT TO NEW AC UNIT. ADD A DISCONNECT SWITCH AT AC UNIT. SPLICE WIRE AT JUNCTION BOX AND EXTED TO AC UNIT AND CONNECT.
- E2 A BUS TAP IS REQUIRED TO SUPPLY POWER TO NEW PANEL PP. PROVIDE LUGS ON THE LOAD SIDE BUS IN THE SWITCHBOARD. FURNISH AND INSTALL 350 MCM CU FROM THE LUGS TO PANEL PP AND CONNECT.
- E3 COORDINATE ALL POWER SHUT DOWNS WITH THE OWNER AND OPERATORS OF THE RINK.



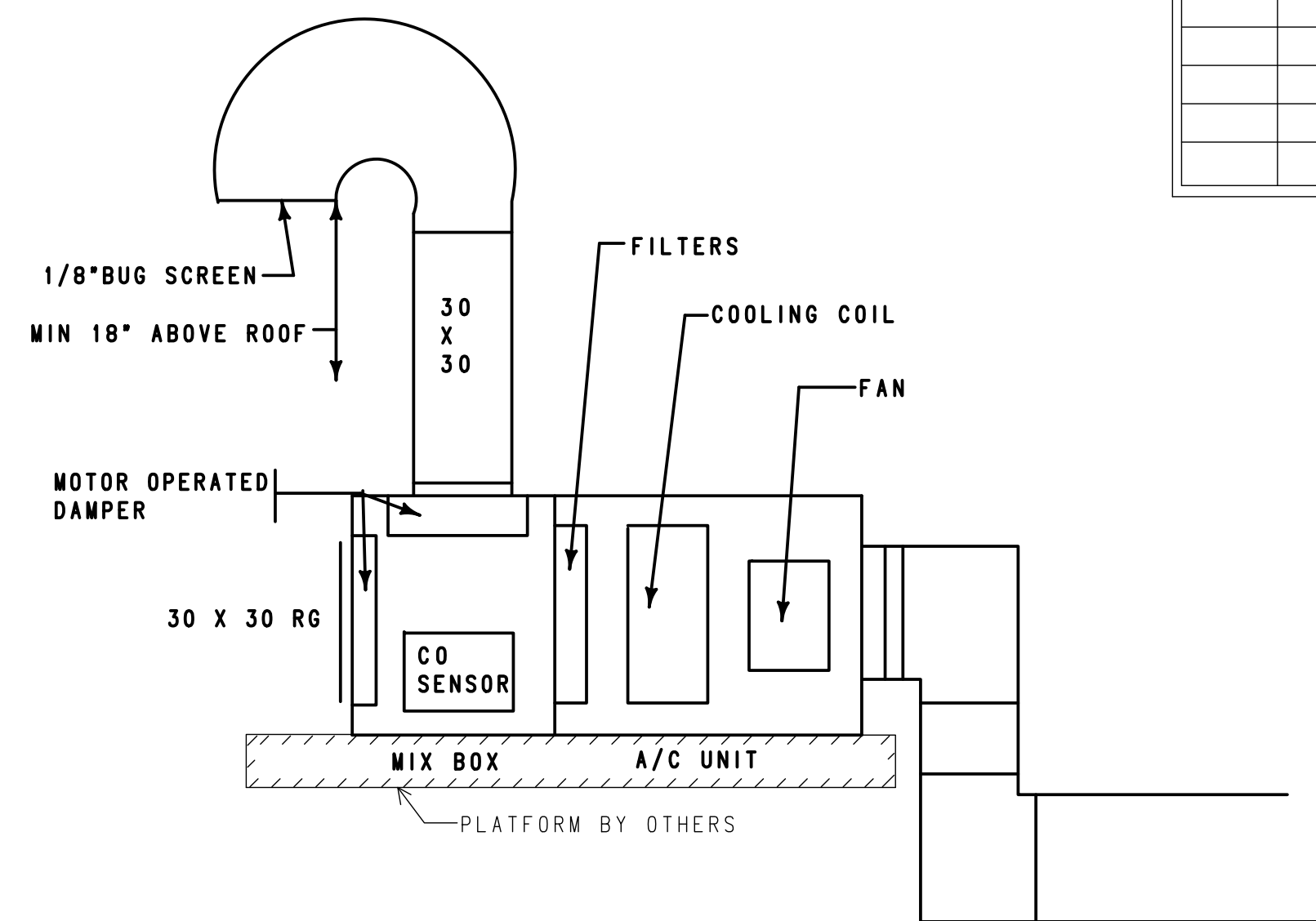
EXISTING FLOOR PLAN
SCALE: 1/16" = 1'-0"

PANEL PP		MOUNTING SURF			300A MAIN C/B				
480 VOLTS		3 PH			3 W				
KW	LOAD	TRIP	POLE	CKT	CKT	POLE	TRIP	LOAD	KW
--	----	--	--	1	2	--	--	----	--
35.0	ACC-1	60	3	3	4	3	60	ACC-2	35.0
--	----	--	--	5	6	--	--	----	--
--	----	--	--	7	8	--	--	----	--
35.0	ACC-3	60	3	9	10	3	60	ACC-4	35.0
--	----	--	--	11	12	--	--	----	--
				13	14				
				15	16				
				17	18				
				19	20				
				21	22				
				23	24				

HVAC LEGEND	
SYMBOL	DESCRIPTION
FD	FIRE DAMPER
VD	VOLUME DAMPER
SD	SUPPLY DIFFUSER
SR	SUPPLY REGISTER
RR	RETURN REGISTER
FR	FLOOR REGISTER
RG	RETURN GRILLE
ER	EXHAUST REGISTER
EG	EXHAUST GRILLE
CFM	CUBIC FEET PER MINUTE
FAI	FRESH AIR INTAKE
()	FLEXIBLE DUCT, SEE SCHEDULE FOR SIZE
BTU	BRITISH THERMAL UNIT
T	THERMOSTAT
RD	ROUND DUCT
⊠	SUPPLY REGISTER/DUCT
⊞	RETURN/EXHAUST REGISTER/GRILLE/DUCT

GENERAL NOTES

- IT IS NOT THE INTENTION OF THESE DRAWINGS TO SHOW EVERY FITTING, HANGER AND/OR OTHER DEVICES REQUIRED TO INSTALL A COMPLETE AND OPERATING HVAC SYSTEM AS THE STANDARDS OF THE INDUSTRY REQUIRES AND TO THE SATISFACTION OF THE ENGINEER.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE STATE BUILDING CODE, AND ALL OTHER STATE AND LOCAL CODES THAT APPLY.
- ALL WORK SHALL BE APPROVED BY THE STATE AND LOCAL INSPECTORS THAT HAVE JURISDICTION. OBTAIN AND PAY FOR ALL PERMITS REQUIRED TO COMPLETE THE PROJECT.
- THIS CONTRACTOR SHALL REFER TO ALL OTHER DRAWINGS RELATED TO THE PROJECT TO DETERMINE THE EXACT LOCATION OF EQUIPMENT AND DEVICES.
- ALL EQUIPMENT TO BE SUPPLIED AS PART OF THIS PROJECT SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED.
- FINAL LOCATION OF ALL EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECTURAL PLANS, MAJOR DISCREPANCIES SHALL BE NOTED IN WRITING.
- ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
- ALL WORK SHALL BE ACCOMPLISHED BY PERSONS SKILLED IN THE MECHANICAL TRADES.



AIR HANDLING SCHEMATIC DIAGRAM
NO SCALE

AIR HANDLING UNIT SCHEDULE

UNIT	CFM	ESP	RET AIR	OUT AIR	HTG IN	CLG MBH	COMP RLA	EVAP FLA	COND FLA	TOTAL FLA	VOLTS	PH	MOCP	WGT	REFERENCE
AC-1, 2, 3, 4	8000	1.0	7200	800	0	240	--	15.0	--	15.0	480	3	35	1200	CARRIER 39LA15
ACC-1, 2, 3, 4	--	--	--	--	0	240	(2)	--	(2)	43.0	480	3	60	1200	CARRIER 38APS025

REVISIONS: 8-28-17 ADDED ELECTRIC WORK

AIR CONDITIONING AND VENTILATION
PLAN, LEGEND & NOTES

TWB ASSOCIATES, INC.
BUILDING CONSULTANTS
130 LIBERTY STREET, UNIT 5B, BROCKTON, MA 02301
TEL 508-559-0418 FAX 508-580-5649 email twbassoc@aol.com

ARCHITECT:

VETERAN'S MEMORIAL RINK
295 TOTTEN POND ROAD
WALTHAM, MASSACHUSETTS

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Job No: 17-1752
Date: AUG 8, 2017
Scale: AS NOTED
Drawn By: TWB
Ck'd By: ARM

Dwg No:

H - 1