

**Solicitation for:
DESIGN & CONSTRUCTION ADMINISTRATION SERVICES
O'BRIEN ICE RINK
#17-RFQ-016
City of Woburn, Massachusetts**

Posted: December 14, 2016

Due: January 6, 2017 at 12:00PM EST

Deliver to:
City of Woburn
Purchasing Department
10 Common Street
Woburn, MA 01801



**DESIGN & CONSTRUCTION ADMINISTRATION SERVICES
O'BRIEN ICE RINK
17-RFQ-016**

RESPONDENT CHECKLIST

**Please ensure all documents listed on this checklist are included, and/or acknowledged,
with your submission.**

_____ Respondents' Checklist

_____ Qualifications Proposal with the following headings:

1. Letter of Introduction _____
2. Summary of Qualifications _____
3. Design Approach _____
4. Design Team _____
5. Design Documents and Cost Estimates _____
6. Bidding/Construction Administration Approach _____
7. Bidding/Construction Administration Services _____
8. Project Closeout Services _____

_____ Standard Designer Application Form for Municipalities and Public Agencies not within Designer Selection Board (DSB) Jurisdiction (Updated May 2014)
<http://www.mass.gov/anf/property-mgmt-and-construction/design-and-construction-of-public-bldgs/designer-selection-process/dsb-forms-instructions-and-manuals/forms/>

_____ City of Woburn Forms

1. Truth in Negotiations Certificate _____
2. Certificate of Non-Collusion and Tax Compliance _____
3. Certificate of Signature Authority _____
4. Insurance Specifications _____

(bidders to review and include in bid package; furnish sample certificate with bid if possible)

_____ Acknowledgement of Addenda (on addendum cover sheets, if applicable)

**SECTION 1.0
INSTRUCTIONS TO OFFEROR**

1.1 General

Sealed submissions will be received on or before **12:00PM, on January 6, 2017**. When submitting qualifications, please identify the solicitation title and number clearly on the submitted envelope. All responses must be sealed and delivered to:

**Purchasing Department
Attention: Michael Gauthier CPCM, MCPPO
City of Woburn
10 Common Street
Woburn, MA 01801**

It is the sole responsibility of the Applicant to insure that the submission arrives on time at the designated place. Late submissions will not be considered, and will be returned

One (1) original and two (2) copies, plus a USB memory stick with the complete submission shall be submitted by the deadline.

Electronic copies are to be submitted on a USB memory stick saved in Microsoft Word or Adobe Acrobat format. ("Read only" files are acceptable). All disks shall be virus checked prior to submission.

A complete response consists of all documents listed on the Respondent's Checklist.

The signature of the Applicant's authorized official(s) must be provided on the cover letter and all the proposal forms. **An unsigned letter or one signed by an individual not authorized to bind the Applicant will be disqualified.**

The City of Woburn reserves the right to reject any or all proposals, waive minor informalities, and accept the proposal deemed to be in the best interest of the City.

The successful Applicant must be an Equal Opportunity Employer.

All information in the Applicant's response should be organized and presented in a clear / concise format, as outlined in the Respondent's Checklist. Accuracy and completeness are essential. The successful response will be incorporated into a contract as an exhibit; therefore, Applicants should not make claims to which they are not prepared to commit themselves contractually.

There must be no mention of the applicant's fee(s) in the submission. Such mention of applicant's and/or its sub-applicant's fees shall subject the submission to disqualification.

The solicitation may be obtained online via the Purchasing web page at www.cityofwoburn.com/bids.aspx or by request from the Purchasing Department on and after **December 14, 2016** between the hours of 9:00 a.m. and 4:30 p.m. Monday – Wednesday, 9:00 a.m. to 7:00 p.m. on Thursdays and 9:00 a.m. to 1:00 p.m. on Fridays.

1.2 Questions

Questions concerning this solicitation must be submitted in writing to: Michael Gauthier, Purchasing Agent, City of Woburn, 10 Common Street, Woburn MA 01801 **before December 29, 2016 at COB.** Questions may be delivered, mailed, faxed to 781-897-5954, or e-mailed mgauthier@woburnma.gov. Answers will be provided in writing only, via an addendum, as noted below.

If any prospective respondents contact anyone employed by the City, outside of the Purchasing Department, regarding this bid/proposal during the open solicitation timeframe, that bidder/proposer will be disqualified immediately.

1.3 Changes & Addenda

If any changes are made to this solicitation, an addendum will be issued. The City will post addenda on its website. It is ultimately the responsibility of the respondent to also monitor the bid portal on the City's website for any updates, addenda, etc. regarding that specific solicitation. The web address is www.cityofwoburn.com/bids.aspx.

A link to all addenda will be emailed to all prospective applicants on record as having picked up the solicitation. **Prospective applicants are highly encouraged to contact the Purchasing Department to register as a bid document holder to automatically receive addenda notifications as soon as they are issued.** No changes may be made to the solicitation documents by the Applicants without written authorization and/or an addendum from the Purchasing Department.

1.4 Pre-Submission Briefing Session

Firms intending on submitting formal qualifications are encouraged to attend a **briefing session on December 19, 2016 at 10:00 a.m.** The conference will be conducted at **O'Brien Ice Rink, 55 Locust St, Woburn MA 08101.**

1.5 Evaluation of Responses

A designer selection committee (the "Committee") will be commenced to review and evaluate design proposals, interview short-listed candidates, and recommend to the Mayor a design firm to undertake the project.

1.6 Key Dates

RFQ Issued	December 14, 2016
Deadline for Submitting Questions	December 29, 2016 COB
Briefing Session	December 19, 2016 @ 10AM
Responses Due	January 6, 2017 @ 12PM EST
Interview of Firms in Competitive Range (If applicable)	Est week of Jan 16th
Fee Negotiation & Contract Award	Est week of Jan 23rd
Services Commence	Mid-Feb 2017
Contract Completion Date	Fall 2017

1.7 Time for Acceptance of Responses to RFQ

The City intends to name a preferred designer within 60 days after the response deadline. The contract award will be made immediately after successful negotiations have been reached between the City and the preferred designer. The time for award may be extended for up to 45 additional days by mutual agreement between the City of Woburn and the preferred designer.

1.8 Unforeseen Office Closure

If, at the time of the scheduled deadline for submission of responses, Woburn City Hall is closed due to uncontrolled events such as fire, snow, ice, wind, or building evacuation, the bid opening will be postponed until 12:00 p.m. on the next normal business day. Responses will be accepted until that date and time.

Note: late deliveries of mail services (including but not limited to USPS, FedEx, UPS, DHL) are not the responsibility of the City. Respondents shall allow sufficient time for responses to be delivered to the City of Woburn's Purchasing Department.

1.9 Modification or Withdrawal of Responses, Mistakes, and Minor Informalities

An Applicant may correct, modify, or withdraw a response by written notice received by the City of Woburn *prior to* the time and date set as the deadline for submission responses. Modifications to a response must be submitted to the City's Purchasing Department in a sealed envelope clearly labeled "Modification No. ." Each modification must be numbered in sequence, and must reference the original solicitation.

After the deadline for responses to this RFQ, an applicant may not change any provision of the response in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the applicant will be allowed to correct them. If a mistake and the intended response are clearly evident on the face of the response, the mistake will be corrected to reflect the intended correct response, and the applicant will be notified in writing; the applicant may not withdraw the bid. An applicant may withdraw a response if a mistake is clearly evident on the face of the response, but the intended correct response is not similarly evident.

1.10 Right to Cancel/Reject Submissions

The City of Woburn may cancel this solicitation, or reject in whole or in part any and all bids (i.e. responses), if the City determines that cancellation or rejection serves the best interests of the City.

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SECTION 2.0
STATEMENT OF WORK

2.1 General

The City of Woburn, through its Purchasing Department is seeking proposals from qualified design firms for the design and construction administration of a refrigerant system replacement, removal of prior system, and separation of electric service metering for the O'Brien Ice Rink located at 55 Locust St, in Woburn, Massachusetts.

There has been a feasibility study conducted for this particular project. The report which includes following considerations and limitations can be found in Appendix A.

Project Phases and Work Plan

Schematic Design w/Preliminary Cost Estimates	5 weeks
35% Design	4 weeks
95% Design and Updated Cost Estimate	2 weeks
100% Construction Documents and Final Cost Estimate	2 weeks
Bidding	TBD
Construction Administration	TBD
(Exclusive of Completion Phase)	TBD

2.2 Services Rendered

The Designer shall perform the following specific tasks in the following phases:

2.2.1 Schematic Design Phase Services

2.2.1.1 Upon receipt of a Notice to Proceed with Schematic Design Phase from the Awarding Authority, the Designer and its appropriate Consultants shall meet with agents of the Awarding Authority and the User Agency to arrive at a mutual understanding of the requirements of project furnished by the Awarding Authority.

2.2.1.2 The Designer shall submit a proposed design work plan for the Designer's Services pursuant to this Contract including anticipated tasks and submittals. The Designer shall submit a proposed Contract Schedule consistent with the project schedule located herein. The schedule shall contain dates for submittals, deliverables, actions, milestones, design workshops, meetings and the critical path through all design service activities. It shall include allowances of time for the User Agency's and the Awarding Authority's review and approval of submittals and for necessary submissions for Permits in connection with the Project. When Approved by the Awarding Authority the work plan and the Contract Schedule shall govern the Designer's duties hereunder. The work plan shall also include a work plan schedule of values consistent with the payment schedule negotiated. The work plan schedule of values shall identify deliverables within each phase and percentages of the phase fee payable upon completion of such deliverable. When Approved by the Awarding Authority the work plan schedule of values shall govern the timing of payments of the Basic Fee upon completion of deliverables within each phase and as each phase progresses.

2.2.1.3 The Designer shall prepare a preliminary evaluation of the Awarding Authority's Program, and construction budget requirements subject to the limitations described in section 2.2.1.4 below. The Designer shall develop at least two (2) alternative designs to a schematic level. For the purposes of the preceding sentence "pre-schematic" means a general design concept level including program space and building envelope, footprint, massing, volume, orientation, and site context. Each pre-schematic alternative shall include a Construction Cost Estimate in Uniformat II Level 1 format. The Designer shall review with the Awarding Authority the alternative designs and shall make a recommendation as to the preferred alternative. Upon selection by the Awarding Authority of the preferred alternative, the Designer shall develop the preferred alternative to a full schematic design level. Designer shall provide a Contract for Final Design and Construction Administration Services the following schematic design level documentation which may include some or all and incorporate Awarding Authority and User Agency comments:

- (a) drawings, concept sketches, three dimensional representations, and specifications;
- (b) a building code analysis;
- (c) an environmental assessment;
- (d) a preliminary life cycle cost analysis to determine which design decisions related to all energy and water consuming devices and overall building operation and maintenance are the most cost effective [M.G.L. c. 149, § 44M and c. 7C, §29],
- (e) a summary of applicable public utility incentive programs as determined by the Awarding Authority and a plan for implementation or inclusion of incentives;
- (f) an analysis of the design's compliance with the Americans with Disabilities Act/Massachusetts Architectural Access Board requirements;
- (g) a space measurement analysis for the design which shall verify that the sum of all program floor areas in the Project plus all other floor areas in the Project equal the Gross Floor Area of the Project;
- (h) a Construction Cost Estimate for the design in Uniformat II Level 2 format with aggregated unit rates and quantities supporting each item and verified as accurate and complete by the cost estimator and/or Owner's Project Manager , if any, employed by the Awarding Authority;

2.2.1.4 Schematic design level documentation shall also include a summary comparing the schematic plans, specifications and Estimated Construction Cost of the design to the Program and Study requirements and shall explain any deviation therefrom. The Designer shall be aware of the following provisions of M.G.L. c. 29, § 26A and shall cause its services to comply therewith:

“No state agency . . . administering a capital facility project shall enter into any contracts for that project . . . or cause to be performed design services for that project . . . if such would result in the completion of a project which cannot be accomplished (a) within the appropriation or authorization for the project or within the project cost limits specified by the appropriation or authorization and (b) without substantial deviation from (i) any study or program which must be prepared in accordance with the provisions of section 7K of this chapter or (ii) any other pre-design planning document which must be prepared in accordance with any other statute, appropriation or authorization or administrative directive consistent therewith.

In no event shall the design work be such as would result in a change in the number of gross square feet to be constructed in the project of more than ten per cent from the number specified in the study, program or other pre-design document referred to [above].”

2.2.1.5 Schematic Design Phase drawings, specifications, Construction Cost Estimates and other submittals shall be subject to the written Approval of the User Agency and the Awarding Authority. Unless a lesser number is requested by the Awarding Authority, the Designer shall submit to the Awarding Authority for approval two (2) copies of schematic design drawings, specifications, cost estimates, and other submittals.

2.2.2 Design Development Phase Services

2.2.2.1 Upon receipt of a Notice to Proceed with the Design Development Phase, the Designer and its Consultants (if applicable) shall meet regularly and as necessary with agents of the Awarding Authority and the User Agency, shall update and refine items submitted during the Schematic Design Phase, and shall submit, on or before the date specified in the Contract Schedule, and on the basis of the Approved Schematic Design Phase documents:

- (a) an updated work plan and Project Schedule;
- (b) a list of all Permits required to implement the design and a schedule of target dates for the procurement of such Permits, in which the list and schedule shall be regularly updated during the term of this Contract;
- (c) information and documentation within the technical expertise of the Designer and its Consultants that is necessary for the Awarding Authority to file Environmental Notification Forms, Environmental Impact Reports, and any other filings for Permits that must be filed during the design development phase;
- (d) complete design development drawings, draft specifications indicating any filed sub-bid sections based on the cost of the work and other documents necessary to specify the size and character of the Project as to siting, landscape, architectural, structural, fire protection, plumbing, HVAC, electrical, ADA/MAAB, product requirements, and other features;
- (e) quality control documentation demonstrating without limitation coordination of: ceiling clearances, mechanical room size, and shaft sizes; specifications and drawings; filed sub-bid work or sections; scheduling; equipment and power; existing and new construction; and phasing;
- (f) design development drawings for which the Designer shall submit for a "tentative approval" review to the public agency having jurisdiction over enforcement of the State Building Code with respect to the Project (the Department of Public Safety of the Commonwealth for state-owned Projects or the building commissioner of the city or town in which the Project is located for other projects);
- (g) an updated life cycle cost analysis to determine which design decisions related to all energy and water consuming devices and overall building operation and maintenance are the most cost effective [M.G.L. c. 149, §. 44M and c. 164, §331];

- (h) a Construction Cost Estimate for the design in Unifomat II Level 3 Contract for Final Design and Construction Administration Services (Revised 9-13) 19 of 61 format, with unit rates and quantities supporting each item, which shall have been reviewed and approved as accurate and complete by any cost estimator or Owner's Project Manager employed by the Awarding Authority with respect to the Project;
- (i) a space measurement analysis for the design verifying that the sum of all program areas in the Project plus all other floor areas in the Project equals the Gross Floor Area of the Project;
- (j) a summary or summaries comparing the design development drawings, specifications and cost estimates with the Program requirements, and explaining any deviations in writing.

2.2.2.2. Such drawings, specifications, cost estimate and other design development submittals shall be subject to the written Approval of the User Agency and the Awarding Authority. Unless a lesser number is requested by the Awarding Authority, the Designer shall submit to the Awarding Authority for approval six (6) copies of design development drawings, specifications, cost estimates, and other submittals.

2.2.3 Construction Documents Phase Services.

2.2.3.1 Upon receipt of a Notice to Proceed with the Construction Documents Phase of the Project from the Awarding Authority, the Designer and its Consultants shall meet regularly as necessary with agents of the Awarding Authority and the User Agency, and based on the submittals Approved in the design development phase of the Project, shall update and refine the items previously submitted and shall submit on or before the date and time specified in the Approved Project Schedule:

- (a) an updated work plan and Project Schedule;
- (b) complete construction drawings and specifications, certified by the Designer as having satisfied the applicable quality control review, approved as required by subsection ii below, in sufficient detail to permit fixed-price bids in open competition for construction of the Project;
- (c) an updated environmental assessment, building code analysis, ADA/MAAB analysis, and a certified list of all required testing and all required Permits as well as a certification that all applicable local, state and utility officials have been contacted by the Designer regarding each utility connection and that the persons responsible for permits or connection approval has agreed to the systems' use;
- (d) structural and energy calculations, building code analysis, ADA/MAAB analysis;
- (e) at the 60% stage of completion of the final drawings and specifications, a Construction Cost Estimate prepared using the Unifomat II Classification to Level 3, including quantities of all materials and unit prices of labor, equipment, and materials as well as a cost estimate for each item of work, for review by the Awarding Authority;

2.2.3.2 The Designer shall furnish a revised and final Construction Cost Estimate, current as of the date of the final bid document submission, including cost estimates for general conditions, overhead and profit, insurance, bonds, and all other items; provisional allowances for work not sufficiently designed at this phase; and allowances expressed as percentage rates for construction contingencies and escalation to the bid date. The final Construction Cost Estimate shall be prepared in Unifomat II Elemental Classification to Level 3 (Sections A-G inclusive) and shall be complete with a single line outline specification description for each item with the detailed unit rate or item cost buildup provided as a backup in each case.

2.2.3.3 The Designer shall furnish a final Construction Cost Estimate, current to the date of the final bid document submission, in Construction Standards Institute Masterformat cross-referenced to the final Unifomat II Construction Cost Estimate. This estimate shall contain the same total and percentage allowances as the final Unifomat II Construction Cost Estimate for overhead and profit and for any further allowances for escalation and other contingencies.

2.2.3.4 The Designer shall also submit a summary comparing the final construction drawings and specifications and final Estimated Construction Cost with the Program requirements and submittals made during the design development phase, explaining any significant deviations.

2.2.3.5 All submittals shall be subject to the written approval of the User Agency and the Awarding Authority. Unless a lesser number is requested by the Awarding Authority or is provided below in Section 2.2.3.6, the Designer shall furnish to the Awarding Authority for approval six (6) sets of the drawings, specifications Construction Cost Estimates and other submittals. The Designer shall also furnish electronic media copies of the foregoing drawings and documents in such form as is required by the Designers Procedures Manual as the Awarding Authority may require.

2.2.3.6. From the Approved construction drawings and specifications, with such changes as the Awarding Authority requires, the Designer shall prepare and transmit to the Awarding Authority a set of reproducible black and white drawings and original specifications both in electronic format and on high quality white bond paper, single-sided, properly packaged, suitable for reproduction, stamped and signed by all disciplines, which documents shall become the property of the Awarding Authority. Other suitable methods may be used with the prior Approval of the Awarding Authority. One copy of the drawings and specifications shall be submitted with the reproducible drawings and specifications.

2.2.3.7. The Awarding Authority will copy the construction bid documents, including advertisements, for receipt of proposals from construction contractors, and for execution of a Construction Contract or contracts. The Designer shall prepare all addenda (to include bidders' questions and Designer's responses), subject to the Approval of the Awarding Authority. The Designer and its Consultants shall attend the pre-bid conference if one is scheduled, taking note of all questions asked. Relevant questions submitted in writing shall be answered by means of written addenda to the bid documents as required.

2.2.3.8 . If within three (3) months after approval of Construction Documents, in final form, the bids of the lowest responsible and eligible bidders exceed the Fixed Limit Construction Cost, the Designer shall, if so instructed in writing by the Awarding Authority, provide such revised construction drawings and specifications and construction cost estimates as the Awarding Authority shall require for the purpose of bringing the cost within the Fixed Limit Construction Cost; provided the Designer may in connection with such revision make reasonable adjustments in the scope of the project subject to the written approval of the Director, which approval shall not be unreasonably withheld. The Designer shall not be paid additional compensation for such services.

2.2.4 Construction Administration Phase Services

2.2.4.1 Consistent with the standard of care and practice stipulated in Section 3.3 above, upon the award of the Construction Contract the Designer and its Consultants shall:

- (a) be charged with general administration of the Construction Contract to the extent set forth herein;
- (b) furnish the general contractor with information for establishing lines and grades and shall prepare a set of plans and specifications that incorporate all addenda and SK drawings issued during the bidding process;
- (c) promptly and in accordance with the requirements of the Construction Contract check, obtain testing where necessary, and approve samples, schedules, shop drawings and other submissions by the general contractor;
- (d) prepare, maintain and update logs for all submittals and changes to the Construction Contract;
- (e) visit the site at intervals appropriate to the stage of construction but not less than weekly, and observe the progress of the work, issue written progress reports, and conduct job meetings, and prepare and distribute meeting minutes to assure that the work is being built in conformance with Approved construction documents;
- (f) report to the Awarding Authority weekly in writing on the progress of the work including whether or not the general contractor is keeping asbuilt drawings updated;
- (g) on a weekly basis (or more often as may be necessarily), make specific recommendations on rejection of all Project work observed by the Designer that fails to conform to the Construction Contract documents, and review and inspect corrected work;
- (h) require each Consultant employed in accordance with Article 3 to make visits weekly during the progress of any work to which that Consultant's services relate and to report upon it in writing to the Designer;
- (i) conduct semi-final and final inspections of the Project and report the results of such inspections in writing to the Awarding Authority;
- (j) observe the balancing of air and water circulation systems and report the results thereof;
- (k) observe the setting and adjustment of automatic controls and report thereon;
- (l) in a timely manner, decide all questions regarding interpretation of, or compliance with, the Construction Contract documents, except as the Awarding Authority may in writing otherwise determine;

- (m) furnish electronic versions of the Record Drawings, a final cost report, and other required documents; and
- (n) assist the Awarding Authority in any bid protest hearings, change order appeal hearings requested under M.G.L. c. 30, § 39Q, and any other litigation, except as provided in Article 6.
- (o) Except as otherwise specifically set forth in the Construction Contract documents, the Designer shall neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Construction Contract documents.

2.2.4.1. The Designer shall submit to the Awarding Authority in a timely manner all requisitions for payment submitted by the general contractor in the form required by the Awarding Authority. With respect to each such requisition, the Designer shall certify to the best of its knowledge that the percentage of work included in the requisition is accurate and that the work performed conforms to the Construction Contract documents. In the event the Designer does not approve the requisition exactly as submitted by the general contractor, the Designer shall forward it for payment to the Awarding Authority dated and signed with corrections with an accompanying letter of explanation setting forth the Designer's objections and recommended changes. The Designer shall coordinate the required visits to the construction site so as to enable it to submit to the Awarding Authority the general contractor's monthly requisition for payment bearing the Resident Engineer's approval or accompanied by the Resident Engineer's letter of exceptions. Timely payments to the contractor are required by M.G.L. c. 30, § 39K; therefore, the Designer shall establish procedures assuring either immediate mail or messenger delivery of the requisition for payment to the Awarding Authority, and shall process requisitions for payment within two (2) working days after receipt of the same.

2.2.4.2 Before examining the requisition for final payment submitted to the Awarding Authority by the general contractor and making any certification in response thereto, the Designer shall obtain from the general contractor As-Built Drawings, including drawings showing the actual installation of the work under the Construction Contract, and recording all changes. The Designer shall ascertain that changes authorized by change orders are shown on the general contractor's As-Built Drawings. The Designer shall revise the applicable original reproducible drawings and electronic media drawings on the basis of the As Built Drawings and shall submit them as Record Drawings electronically along with two sets of prints to the Awarding Authority; which Record Drawings shall become the property of the Awarding Authority, all as part of its Basic Fee.

2.2.4.3 At the conclusion of the Construction Contract the Designer shall assist the Awarding Authority's Authorized Representative or Owner's Representative in the evaluation of the performance of the general contractor as required by M.G.L. c. 149, § 44D or any other law.

2.2.4.4 Two suitably bound legible copies of all original design and quantity calculations including those pertinent to change orders and shop drawings if applicable shall be furnished by the Designer to the Awarding Authority at the conclusion of the Construction Contract.

SECTION 3.0 EVALUTION AND AWARD OF CONTRACT

3.1 General

The City may award a contract to a responsive and responsible Applicant deemed to be the most highly qualified based on the evaluation procedures and fee negotiations described herein. The City reserves the right to reject any and all responses if it determines that it is in the best interest of the City to do so.

3.2 Specifications and Proposal Requirements

Each design services proposal will contain a table of contents with the following headings and corresponding content:

1. Letter of Introduction
2. Summary of Qualifications
3. Design Approach
4. Design Team
5. Design Documents and Cost Estimates
6. Bidding/Construction Administration Approach
7. Bidding/Construction Administration Services
8. Project Closeout Services
9. Standard Designer Application Form

A response that does not provide the information and documentation requested may be deemed nonresponsive and therefore rejected.

3.2.1 Letter of Introduction – Signed by a principal in the firm serving as the lead applicant on the application. The applicant must certify in the Letter of Introduction that it meets the following minimum requirements.

- a) Be a qualified Designer within the meaning of M.G.L. Chapter 7C, Section 44, employing a Massachusetts registered architect responsible for and being in control of the services to be provided pursuant to the Contract.
- b) In the event that the City receives financial assistance for this project from the Commonwealth of Massachusetts, the Applicant must be prepared to comply with all the necessary requirements pursuant to M.G.L. Chapter 7C, Section 6. The Designer must agree to contract with minority and women-owned businesses as certified by the Supplier Diversity Office, and at the required participation levels for minority business enterprises and women-owned business enterprises.

3.2.2 Summary of Qualifications – Include the firm's organizational capacity and strengths. List at least three but no more than six relevant projects with a brief description of the challenges, strategies and measures incorporated on each job and include a client reference for each. Include information on the variance between the firm's construction cost estimates and actual bid pricing.

3.2.3 Design Approach – Discuss how you envision the challenges and opportunities presented by this specific project and how you might meet them to ensure a successful outcome. The City highly encourages respondents to use this opportunity to elaborate on their thinking and experience with respect to this project and to highlight those aspects of their qualifications that make them the most attractive design team.

3.2.4 Design Team – Identify the players of the team (including consultants) for the following categories of work. State the firm’s name, individual’s name, professional registration or license number as applicable, and whether or not the firm is certified by the Commonwealth of Massachusetts Supplier Diversity Office (SDO) as an MBE and/or WBE. Include a summary of each team member’s experience, role on the team for this project, and approximate percentage of time allocated to this project. A resume or CV of each proposed team member shall be included in the respondent’s submission.

Example categories of work :

- Engineering – Civil, Structural, Mechanical, Electrical;
- Architecture;
- Landscape Architecture;
- Cost Estimating;
- Geotechnical;
- Industrial Hygiene;
- Code Consulting;
- Sustainable/Green Design/Renewable Energy Consulting;
- Building Commissioning
- Other (as proposed by applicant)

3.2.5 Design Documents and Cost Estimates – Discuss how the firm will develop a comprehensive and sustainable program for the building, and how it will be incorporated into cost estimates and bid documents that are accurate, complete and well-coordinated. The selected firm will be responsible for producing two (2) schematic design options and associated budget estimates. Once a preferred option is selected, the design team will produce drawings, specifications and cost estimates in accordance with the milestones outlined above in the outline of project phases. After the City reviews and provides feedback, then a bid-ready set of construction documents and a final cost estimate will be produced.

The design firm will also include four (4) two-hour scoping meetings with user groups and the preparation and distribution of meeting minutes. The designer will produce eight (8) printed sets of construction documents in addition to an electronic version.

3.2.6 Bidding and Construction Administration Services – Discuss your Design Team’s approach to this phase of the work. The City’s expectations of the designer in this role are outlined as follows. In addition to attending a pre-bid site meeting and preparing any addenda in coordination with Purchasing and School Department, the designer should assume a five (5) month construction schedule with attendance at weekly site- based job meetings. The design firm will be responsible for preparation and distribution of meeting minutes. Additionally, the designer will review and process RFI’s, submittals, shop drawings and potential change orders, and will create a log of each, updating them weekly. The designer will review payment requisitions and will prepare any change orders.

3.2.7 Project Closeout Services – Discuss respondent’s approach to project closeout services. The City’s expectations on this project include: punch list inspection and follow-up; final inspection and certification; coordination of warranties; energy efficiency credit documentation (if applicable); O&M documentation and training (if applicable); and coordination and delivery of as-built record drawings.

3.2.8 Standard Designer Application Form for Municipalities and Public Agencies not within DSB Jurisdiction (Updated May 2014). In addition to the above-listed components of the qualifications narrative, applicants shall complete and submit this form as developed by the Designer Selection Board of the Commonwealth of Massachusetts. The form is attached in Appendix B. It may be obtained online at: <http://www.mass.gov/anf/docs/dcam/dlforms/dsb/14-5-12-dsb-application-form.pdf>

3.3 Selection Criteria

The selection process will include an evaluation procedure based on the general criteria identified below and detailed in section 3.4 Evaluative Criteria.

Following the rating of all fully responsive submissions, the Selection Committee appointed by the Superintendent will identify, or “short-list,” at least three (3) applicants with the highest ratings by the Committee. The Committee may choose to interview the short-listed applicants.

- Training/educational background appropriate to the project as described in the Request for Qualifications of all project personnel, including professional experience above and beyond the minimum qualifications.
- Depth of experience with similar projects, and prior experience with other historic building preservation/restoration and rehabilitation projects.
- Identity and qualifications of all project personnel.
- Strength of past performance.
- Demonstrated understanding of the tasks to be performed and products to be created.
- Completeness of submission.
- Current workload and ability to undertake the contract based upon the number and scope of projects for which the consultant is currently under contract.
- Geographical proximity of the consultant to the project site or willingness of the consultant to make site visits.
- Excellence of oral and written communication skills.

3.4 Comparative Evaluation Criteria

Comparative Evaluation Criteria will be applied uniformly to all proposals. Each criterion shall be rated as follows:

“**Unacceptable**” 0 points - submission does not address the elements of this criterion

“**Not Advantageous**” 1 point - submission does not fully meet the evaluation criterion or leaves a question or issue not fully addressed

“**Advantageous**” 2 points - submission meets evaluation standard for the criterion

“**Highly Advantageous**” 3 points - submission excels on the specific criterion, to include:

1: Training/Formal Education

Training/educational background appropriate to the project as described in the Request for Qualifications of all project personnel, including professional experience above and beyond the minimum qualifications

Points	Rating	Description
0	Unacceptable	The proposal indicates evidence of training or educational background in discipline necessary to complete this project of less than a bachelor degree.
1	Not Advantageous	The proposal indicates evidence of training or educational background in discipline necessary to complete this project of only a bachelor degree.
2	Advantageous	The proposal indicates evidence of training or educational background in a discipline necessary to complete this project of a bachelor degree and five or more years actual experience in one or more area of expertise in consulting necessary to complete this project.
3	Highly Advantageous	The proposal indicates evidence of training or educational background in a discipline necessary to complete this project of a masters degree in one or more area of expertise in consulting necessary to complete this project.

2.Experience

Depth of experience with similar projects, and prior refrigeration, ice rink, and electric meter separation experience of all project personnel, including professional experience above and beyond the minimum qualifications outlined in this RFQ.

Points	Rating	Description
0	Unacceptable	The proposal indicates no evidence of experience with similar projects, and prior experience with other refrigeration system, ice rink, and electric meter separation type projects.
1	Not Advantageous	The proposal indicates evidence of experience with similar projects, and prior experience with other refrigeration system, ice rink, and electric meter separation type projects one and five years.
2	Advantageous	The proposal indicates evidence of experience with similar projects, and prior experience with other refrigeration system, ice rink, and electric meter separation type projects six and fourteen years.
3	Highly Advantageous	The proposal indicates evidence of experience with similar projects, and prior experience with other refrigeration system, ice rink, and electric meter separation type projects fifteen years and more

3: References

Strength and credibility of client references.

Points	Rating	Description
0	Unacceptable	The proposal indicates no strong and credible client references with contact information.
1	Not Advantageous	The proposal indicates less than five strong and credible client references with contact information.
2	Advantageous	The proposal indicates six to ten strong and credible client references with contact information.
3	Highly Advantageous	The proposal indicates eleven or more strong and credible client references with contact information

4: Qualifications

Professional qualifications of the consultant and all project personnel, including professional experience above and beyond the minimum qualifications outlined in the Request for Qualifications.

Points	Rating	Description
0	Unacceptable	The proposal fails to indicate a well-established firm/applicant, with proximity or availability of staff to complete work. The proposal provides no evidence that the firm/applicant is large enough and diverse enough to expedite all work within the City's schedule.
1	Not Advantageous	The proposal fails to provide either evidence of a well-established firm/applicant, with proximity or availability of staff to complete work. The proposal provides insufficient evidence that the firm/applicant is either large enough or diverse enough to expedite all work within the City's schedule.
2	Advantageous	The proposal provides a history of the firm/applicant, with proximity or availability of staff to complete work. The proposal provides adequate evidence that the firm/applicant is large enough and/or diverse enough to expedite all work within the City's schedule.

3.5 Selection Process

All proposals will be reviewed and rated by a mixed team of City Employees ("the Committee"). The Committee will rate and rank all candidates and make a recommendation to the Mayor to enter negotiations with highest ranked firm.

Prior to its recommendation to the Mayor, the Committee may choose to select a minimum of three (3) applicants to be interviewed ("competitive range"). The Chief Procurement Officer will notify all applicants of the names of the applicants who fall into competitive range. Those applicants will be notified, either by e-mail or telephone, of the date, time and place for their interviews and any other pertinent information related thereto.

Within a reasonable period of time after the last interview, the Committee will forward to the Mayor its recommendation of the final ranking of the short-listed applicants. The list will be accompanied by a written explanation of the ranking including the recorded vote, if any. The written explanation and recorded vote, if any, shall be public records and shall be maintained in the contract file.

3.6 Fee Negotiations

The City shall request a fee proposal from the most highly ranked designer remaining on the list and begin contract negotiations. If the City is unable to negotiate a satisfactory fee with the first-ranked designer, negotiations shall be terminated and undertaken with the remaining designers, one at a time, in order in which they were ranked by the Committee until agreement is reached. In no event may a fee be negotiated that is higher than the maximum not-to-exceed fee established prior to selection of finalists. If the City is unable to negotiate a satisfactory fee with any of the finalists, the Mayor shall recommend that the Committee select additional finalists from the original pool of applicants or re-advertise the RFQ.

Once successful negotiations have concluded (for a not-to-exceed fee), the City will prepare the contract and submit it to the successful applicant for signature. Upon receipt of the executed contract and all other required documents from the designer, the City Solicitor's Office will have the contract signed by the appropriate City officials. This award will result in the issuance of a purchase order to be delivered with a fully executed contract to the designer. Unless otherwise stated, the issuance of the purchase order and fully executed contract is tantamount to a Notice to Proceed, at which time the successful applicant will be expected to begin work under the contract.

SECTION 4.0 FORMS

4.1 Required Submissions (included with response)

4.1.1 Past Performance / Reference Sheet

Note: Respondents may cross-reference data already provided on Standard Designer Application; contact names, phone numbers, e-mail addresses, contract value, and summary of work completed are required by the City of Woburn.

4.1.2 Non-Collusion & Tax Compliance Form

4.1.3 Certificate of Signature Authority

4.1.4 Truth in Negotiations Certificate

4.2 Required Submissions (to be provided post award)

4.2.1 Insurance Certificate: As outlined on attached form included in this solicitation, must be provided by the **awarded vendor** within

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.

Signature of individual submitting bid or proposal

Name of Business (please type or print)

CERTIFICATE OF TAX COMPLIANCE

Pursuant to Massachusetts General Law Chapter 62C, Section 49A, the undersigned acting on behalf of the Contractor*, certify under penalties of perjury that to the best knowledge and belief, the Contractor* is in compliance with all laws of the Commonwealth relating to taxes, reporting of employee and contractors, and withholding and remitting child support.

Individual

Signature Date

Name (please print or type) Social Security Number

Corporate

Corporate Name (please print or type)

Signature of Corporate Officer Date

Name of Corporate Officer (please print or type) Title

Taxpayer Identification Number

- As used in this certification, the word "Contractor" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

CERTIFICATE OF AUTHORITY

At a duly authorized meeting of the Board of Directors of _____
(Name of Corporation)

held on _____ it was VOTED that:
(Date)

(Name)

(Officer)

of this corporation, be and he/she hereby is authorized to submit bids and proposals, execute contracts, deeds and bonds in the name and on behalf of said corporation, and affix its corporate seal hereto; and such execution of any contract, deed or obligation in this corporation's name on its behalf by such _____ under seal of the company, shall be valid
(Officer)

and binding upon this corporation.

A True Copy,

ATTEST: _____

TITLE: _____

PLACE OF BUSINESS: _____

DATE OF THIS CERTIFICATE: _____

I hereby certify that I am the clerk of the _____
(Corporation)

that _____ is the duly elected _____ of
(Name) (Office)

said corporation, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

(Clerk)

CORPORATE SEAL:

DESIGNER'S TRUTH-IN-NEGOTIATIONS CERTIFICATE

For Negotiated Fees

The undersigned hereby certifies under penalties of perjury that the wage rates and other costs used to support its compensation are accurate, complete and current at the time of contracting.

The undersigned agrees that the original contract price and any additions to the contract may be adjusted within one year of completion of the contract to exclude any significant amounts if the City determines that the fee was increased by such amounts due to inaccurate, incomplete or noncurrent wage rates or other costs.

BY: _____

Name and Title: _____

Project: _____

Date: _____

Reference: M.G.L. c. 7 § 38H (b)

**PROFESSIONAL LIABILITY INSURANCE SPECIFICATIONS
INSURANCE REQUIREMENTS FOR AWARDED VENDOR ONLY:**

Prior to commencing performance of any work or supplying materials or equipment covered by these specifications, the contractor shall furnish to the Office of the Purchasing Director a Certificate of Insurance evidencing the following:

A. PROFESSIONAL LIABILITY - Comprehensive Form

Bodily Injury Liability.....\$ One Million
Property Damage Liability.....\$ One Million

**B. COVERAGE FOR PAYMENT OF WORKER'S COMPENSATION BENEFIT
PURSUANT TO CHAPTER 152 OF THE MASSACHUSETTS GENERAL LAWS IN
THE AMOUNT AS LISTED BELOW:**

WORKER'S COMPENSATION.....\$ Statutory
EMPLOYERS' LIABILITY.....\$ Statutory

C. AUTOMOBILE LIABILITY INSURANCE AS LISTED BELOW:

BODILY INJURY LIABILITY.....\$ Statutory

1. A contract will not be executed unless a certificate (s) of insurance evidencing above described coverage is attached.
2. Failure to have the above-described coverage in effect during the entire period of the contract shall be deemed to be a breach of the contract.

Note: If your insurance expires during the life of this contract, you shall be responsible to submit a new certificate(s) covering the period of the contract. No payment will be made on a contract with an expired insurance certificate.

APPENDIX A
FEASIBILITY STUDY, SYSTEMS ANALYSIS, AND 10 YEAR
RECOMMENDATION



MACLAUGHLIN
MANAGEMENT & DESIGN

Ice Skating & Sports Facility Consultants

March 3, 2016

MacLaughlin Management & Design (MMD) has been contracted by the City of Woburn to evaluate the existing refrigeration equipment at the O'Brien Ice Rink, and to recommend options for its replacement. Additionally, MMD has been asked to identify and price renovation work at the rink beyond the refrigeration that may need to be completed over the next ten years. Finally, MMD has been directed to conduct an analysis of the existing electric service located inside the adjoining school building for the purpose of isolating the rink's electrical consumption. The following are the findings requested by the City, and MMD's recommendations.

Section 1: Existing Refrigeration Plant Conditions

The existing refrigeration plant, located in the mechanical/Zamboni room at the far end of the rink, was installed between 30 and 35 years ago. It was manufactured by ACME/Ketema and is comprised of 105 tons of refrigeration with a 2 circuit R-22 refrigerant indirect glycol expansion chiller that has been converted to evaporative condensing by the installation of two small condensers outdoors. There is an internal sump tank that has a closed coil installed for the underfloor circuit heat exchange. There is a single condenser water pump. The refrigerated ice slab floor pumping is two stage by use of a 10 HP pump on low speed and a 25 HP on high speed. The controls for the refrigeration equipment are antiquated and there are no variable speed drives on the pumps to decrease electric consumption.

The newer electrical switch gear service in the mechanical/Zamboni room is 600 Amps at 480 volts with 450-500 amps dedicated to the refrigeration system. This electrical service appears adequate to handle a new refrigeration plant although there will be electrical cost for wiring the new equipment. An indoor mobile snow melt bunker manufactured from metal is installed in the room. It is not an original design. A single low profile gas unit heater maintains an indoor temperature within the mechanical/Zamboni room. The room is capped by with an insulated acoustical drop ceiling at what appears to be at about 10 feet off the floor. This ceiling has been damaged by the Zamboni when it dumps the shavings in the snow melt bunker. The room does have an exhaust fan, but it is unclear where the makeup air is being taken from.

It is our opinion that the refrigeration system has exceeded its manufacturers expected life cycle. The refrigeration plant, although operating, has had many reliability issues in

the past relating to compressor breakdowns and refrigerant migrations. The refrigerant within the plant will migrate from one circuit to the other resulting in a service call to have a technician transfer the refrigerant back. Not only is this an expensive service call, it leaves the ice slab without cooling which is very disconcerting to the rink operator. Furthermore, the main refrigerant utilized by O'Brien's refrigeration plant, Freon R-22, has been identified as being detrimental to the environment. R22 will now longer be produced or available within 5 years (2020). The existing refrigeration plant is inefficient, and due to the ongoing breakdowns, the maintenance costs are significantly higher than normal.

The existing dehumidifier located on the upper level at the far end of the rink is operationally functional. It is a desiccant unit which has 5-7 years of service left.

Recommendations:

Although there is no apparent immediate threat that the refrigeration equipment will fail, it needs to be replaced to avoid the current high electric consumption of the system and the ongoing high maintenance cost. The current refrigerant R-22 will not be available within five years.

- Replace existing refrigeration chiller and pumps
- Install a digital refrigeration control system with communication capability directly to the manager's office.
- Install a new cooling tower or fluid cooler outside
- Install new sump tank with pumps
- Construct a new snow melt pit and snow melt coil utilizing waste heat from the chiller to melt ice shavings
- Elevate and reconstruct the 10' ceiling over Zamboni and snow melt pit
- Meter the electrical consumption of the ice rink- separate from school electric use

Replacement Options:

- A. ACME Screw Chiller-Freon 507- Bitzer open drive screw compressors, water cooled condensers, DX chiller with electronic expansion valves, snow melt and underfloor heat exchangers, 2 circuits- one new cooling tower with remote sump tank. Need to install a wall separating plant from Zamboni and move second Zamboni outside into new covered structure

Cost: \$530,000.00 includes wall separation
Efficiency: Saving projection 10% per year
Maintenance: \$7,000.00 Annually
Overhaul: \$15,000.00 Every 5 years
Rebate: Estimate- \$15,000.00- \$20,000.00
Life Cycle: 30 years

- B. Bitzer Screw Chiller- Freon 507- water cooled by use of open cooling tower and indoor shell and tube condensers- increased efficiency through use of variable speed drives on pumps and sub cooling of liquid lines with economized

connections at the compressors- 2 circuit compressors to have soft starts for efficiency- 2 heat exchangers- Need to install wall and move second Zamboni outside

Cost: \$570,000.00 includes wall separation
Efficiency: Savings projection 15% per year
Maintenance: \$3,000.00 Annually
Overhaul: \$10,000.00 Every 5 years
Rebate: Estimate-\$35,000.00- \$40,000.00
Life Cycle: 30 years

- C. Modular Screw Chiller- Freon R410A- 5 modules each rated at 21 tons to produce a total of 105 tons- Bitzer compressor- 5 circuits- heat exchanger and open cooling tower with heated outdoor sump- Indoor heat exchanger and pumps with interconnecting PVC lines heat traced and insulated-modular units also contain glycol to heat the underfloor heating system, snow melt pit, and could heat the mechanical Zamboni room. The units would also reduce the size of the cold floor pumps and reduce electric consumption-digital control system- variable speed pump drives-reclaim heat for rink area as well- No need for new wall-No need to move second Zamboni off site.

Cost: \$650,000.00
Efficiency: Savings 20% per year
Maintenance: \$3,000.00 Annually
Overhaul: \$9,500.00 Every 5 years
Rebate: Estimate-\$40,000.00 to \$50,000.00
Life Cycle: 20 years

Snow Melt Pit: \$50,000.00 optional

Zamboni Storage: Stored off site in City owned garage- Option A&B

Cost Summary:

Option A: \$630,000.00 (equipment, wall, electrical, demolition, ceiling)

Option B: \$670,000.00 (equipment, wall, electrical, demolition, ceiling)

Option C: \$750,000.00 (equipment, electrical, demolition, ceiling)

Two Phased Approach:

Option B Bitzer Screw Chiller Package can be installed in two phases to reduce initial capital cost:

Year 1-

Chiller Package: \$360,000.00 existing pumps, condensers remain- inc demo

Ventilation Upgrade: \$ 15,000.00

Leak Detector:	\$ 5,000.00
Electric Heater:	\$ 10,000.00
Wall with Door:	\$ 35,000.00
Electric Wiring:	\$ 50,000.00
Ceiling Repair:	\$ 10,000.00
Total:	\$485,000.00

Year 2-

Condensers:	\$ 80,000.00
Sump Indoor:	\$ 30,000.00
Cold floor pumps:	\$ 25,000.00
Demolition:	\$ 25,000.00
Heat Exchanger:	\$ 25,000.00
Total:	\$185,000.00

Two Phase Total: \$670,000.00

Section 2- Ten Year Renovation Needs

MMD met several times on site with Nick Thomas, O'Brien rink manager, to evaluate existing conditions of the facility and develop the following list of items that will need to be renovated or replaced over the next 10 years.

Overall, we feel that, other than the refrigeration equipment which is at its life cycle end, the rink is in good operating condition. There does not appear to be any components of the rink that need immediate renovation or replacement. According to the operator of the rink, the roof has recently been replaced, the cooking equipment in the snack bar has been upgraded, and the dasher board system is 7 years old and appears to function well. There is a low-emissivity ceiling (reduces heat load on ice from sun on roof) in place above the ice surface which was installed 10 years ago and is in good condition. The seating in the facility is well maintained and adequate for spectators. The lobby, snack bar area and offices all are functioning well and area clean. The 8 locker rooms vary in size, but are adequate for the user groups skating at the rink. Both Zamboni's are in good condition and the scoreboard is working fine.

Looking out over the next 10 years the following rink components should be upgrades or replaced:

- Rubber flooring in 6 of the public locker rooms- #1,2,3,4,7&8- (5&6 are high school locker rooms with carpet)- approximately 2,000 sf- \$12,000.00 remove existing, clean surface, reinstall black skate resistant rubber flooring 3/8" thick Replaced within the next 3-5 years.
- Air intake for heating system located upstairs next to the conference room needs to be renovated to prevent snow from being drawn during a storm into the room and melting on the floor. Recommend a snow filter with a drain added to intake to prevent the pooling of water from melting snow- \$20,000.00- Renovate within the next 1-3 years.

- Lighting currently T-5 fluorescent lighting which should be replaced with LED lighting to lower utility cost and lower maintenance. There would be a rebate from Eversource. 25,000.00 1-3 years.
- Air Handler, located at the office end of the rink will need to be upgraded- \$20,000.00 2-3 years.
- Dehumidifier is a Bry Air desiccant system which is function adequately but do to age, I would expect that it will need to be replaced over the next 5-7 years at a cost of \$125,000.00.
- The sound system needs to be replaced which is typical in a rink of this age. A new system would be \$30,000.00- 2-3 years
- The ice floor does not show any signs of heaving and there is no loss of refrigerant flowing through the imbedded piping. According to the operator, the floor was replaced in 1995 which makes it 21 years old. Expected life of a floor is between 30-35 years. At this point I would not expect any issues within the next 10 years, but a budget for replacing the floor at today's cost is \$375,000.00 which includes demolition of the existing concrete slab. I would plan on replacing the ice floor in 10-15 years.

Section 3- Electrical Service:

MMD and its' electrical engineer, Fred Goff, evaluated the feasibility of separately metering the ice rink from the Middle School. Currently, the billing of the two facilities for electrical usage is determined through a formula which determines the usage on a monthly basis. It does not reflect actual usage. We were not able to look at the spreadsheet at the time of our site visit as it was not available. If we were able to see the spreadsheet for electric usage we would be in a position to evaluate the formula to determine its validity.

There are two methods of dealing with separating the metering:

The first method would be the installation of Emon- Demon meters on selected or modified feeders to separate the ice rink from the gymnasium. The Emon-Demon metering system would require the client to check the kilowatt hours and electric demand at several locations monthly to determine the KW and the electrical demand of the ice rink versus the demand of the Middle School. Once these determinations are made, the ice rink's electric consumption can be accurately determined and deducted from the overall monthly bill. Using this method, the electric bill would not automatically separate the two facilities.

The second method would be to fully modify the existing building electric service so that the ice rink would be billed directly and separately for their electric consumption from the school.

Both of these methods have significant cost implications to implement. Based upon our walk through of both facilities, we feel the cost associated with installing the Emon-Demon metering system would be \$30,000.00- \$35,000.00. This includes the cost of the metering equipment, new electric panel boards, and modifications to existing panel boards. The alternative, a full modification and separation of the electric service to individually meter the ice rink would be \$125,000.00

4.-Summary/Conclusions:

Although there is no apparent evidence that the refrigeration system at the rink will fail over the next 6 to 12 months, the equipment needs to be replaced in 2017. The refrigeration plant is beyond its expected life cycle and as a result, it is inefficient as compared to new plants and ongoing maintenance cost are very high.

We recommend replacing the refrigeration system during the summer shut down of 2017 with Option B- Bitzer screw package, listed above. This option will provide the rink with a highly efficient refrigeration package that requires low maintenance. It also allows the City to complete the refrigeration replacement in two phases if necessary.

It is important to note that the existing mechanical room which houses the refrigeration equipment needs to be brought up to code. This includes building a new wall to separate the refrigeration equipment from the Zamboni, new electric heater, upgrading the ventilation, repair ceiling, and adding a refrigerant leak detector.

Design and Construction Schedule:

- May, 2016- July 2016 design and estimate upgrades to mechanical room- once this is completed decision can be made if work to be completed by City employees or outside contractor
- August, 2016- November 2016 develop specifications and drawings for bidding refrigeration replacement
- December, 2016- bid refrigeration project
- January, 2017- award project
- February, 2017 to April, 2017- order refrigeration equipment
- May, 2017- start renovation of mechanical room
- August, 2017- complete all renovation and make ice

Finally, it is recommended that the electric service for the rink be metered to segregate the KW consumption from the school. As indicated in the report, this can be accomplished by either installing a completely new service, which would generate separate electric bills (rink vs. school), or adding meters to existing feeders and then deducting the rink consumption from the single bill.

O'BRIEN RINK
Woburn, MA

Energy Conservation Report

Final Report
August 30, 2016

PREPARED FOR

Eversource
ESA#:

PREPARED BY

Andelman and Lelek Engineering, Inc.
1408 Providence Highway
Norwood, MA 02062
(781) 769-8773

TABLE OF CONTENTS

Project Contact Information	3
Executive Summary	4
Facility Description	6
General	6
Architectural	7
Mechanical Systems	7
Lighting Systems and Equipment Loads	7
Domestic Hot Water System	7
Analysis Methodology and Baseline Design Description	8
Energy Conservation Measures	9
ECM # 1: High efficiency brine chiller	10
Appendix A: Minimum Requirements Documents	12
Appendix B: Miscellaneous Supporting Data	13
Appendix C: Custom Application	18
Appendix D: eQuest Output Summary Table	24

PROJECT CONTACT INFORMATION

Customer's Facility/Project Location

O'Brien Ice Rink

Customer's Contacts: McLaughlin Management and Design

Terry McLaughlin	Principal	603-686-0423 mmd.consultants@comcast.net
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Eversource Electric Company

Steve Grattan	Program Manager	781-441-8243 steven.grattan@eversource.com
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Mechanical Engineer: Refrigeration Engineering & Contracting Co, Inc. (Recco)

Peter Comeau	CEO	781-396-8780 pcomeau@reccousa.com
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TA Study Consultants: Andelman and Lelek Engineering, Inc.

Michael Andelman	Principal	781-769-8773 mike@andelmanlelek.com
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Jeff Gilbert	Project Engineer	781-769-8773 jeff@andelmanlelek.com
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EXECUTIVE SUMMARY

McLaughlin Management and Design and Eversource secured the services of Andelman and Lelek Engineering, Inc. to perform a technical assistance (TA) study to evaluate several energy conservation measures (ECMs) for the O'Brien Ice Rink located in Woburn, MA. A brief summary of the recommended measures is provided below.

ECM # 1 – High efficiency brine chiller

This measure analyzes the benefits of replacing the current chiller with a new high efficiency electric screw chiller. The new chiller will also include a control system that can consistently maintain a higher ice temperature. Installing a new chiller will result in electric savings due to the improved electrical efficiency of the proposed refrigeration system.

The measures were analyzed by generating an hourly simulation of building energy consumption using the eQuest modeling tool. The proposed chiller electric efficiency information was provided by the Refrigeration Engineering & Contracting Co, Inc. (Recco Inc.). Table 1 at the end of this section summarizes the energy and cost analysis for the ECMs. Other sections of the report include:

- *Facility Description* – this section describes the building and its mechanical and electrical systems
- *Analysis Methodology* – this section provides information on the method of the engineering analysis
- *Energy Conservation Measures* – this section provides a detailed description of the measure evaluated in the study

Table 1: Summary of Energy Conservation Measures

ECM #	Measure Description	Electric Energy Savings and NEBs				Total Cost Savings	Incremental Cost	Simple Payback
		Electric Savings		Gas Savings				
		kWh	\$	Therms	\$	\$	\$	years
ECM #1	High Efficiency Brine Chiller	127,530	\$18,846	960	\$407	\$19,253	\$109,237	5.7
All Measures Combined (Interactive)	Total Savings and Costs	127,530	\$18,846	960	\$407	\$19,253	\$109,237	5.7
	Percentage Reductions	17.8%		3.0%		14.0%		
	Incentives	Electric: TBD		Gas: TBD		Total Incentive: TBD		
	Net Cost & Payback							TBD

FACILITY DESCRIPTION

General

The O'Brien ice rink in Woburn, MA is a one story building with a total area of approximately 73,200 sf. The ice rink area contains a standard ice rink (200 ft x 85 ft) and bleachers for spectators. The bleachers have a capacity of approximately 1,000 people, which is reached annually when the facility hosts games for the Massachusetts Interscholastic Athletic Association (MIAA) hockey tournament. Other spaces in the building include offices, storage areas, the ice rink machine room, locker rooms, and a fitness area.

The ice rink is completely closed during the months of May and June. Ice making begins during the final two weeks of July. During August, the rink is not very busy, and is not open on the weekends. After Labor Day the youth hockey program starts up and the rink is open 7 days a week. Most of the time the rink is used for hockey, it's only used for recreational skating a small portion of time.

During a typical week the building is open from 5:30 AM-11 PM every day. It is estimated that weekday morning hockey practices have about 30 people on the ice. During the middle of a week day, the rink is rented out by various hockey clubs but is generally less busy than before and after school. It is estimated that weekday afternoon hockey practices have about 30 people on the ice and 30 people in the spectator gallery. The weekends tend to be very busy all day due to youth hockey competitions. A summary of the normal hockey season occupancy information is provided in the table below.

Normal Hockey Season Occupancy (September-end of March)

	5:30-AM-8 AM	8 AM – 4PM	4PM-11PM
Weekday	30 people	15 people	60 people
Weekend	80 people	80 people	80 people

The busiest time of year for the rink is during high school hockey season, which begins after Thanksgiving and ends at the end of February. During the months of December-February there are about six varsity/junior varsity hockey games played at the arena per week. Games will typically have about 30 people on the ice (including players on the bench) and about 100 people in the stands. During the first few weeks of March some of the MIAA hockey tournament games are hosted at the O'Brien ice rink, and the spectator gallery is at full capacity of approximately 1,000 people. For the purposes of this study, it is assumed that the rink will host four of these high capacity games during the first weekend of March.

After high school hockey is over, the youth programs continue until the end of March. During April the rink is rented by smaller private groups for figure skating, etc.

Figure Skating Occupancy (April)

	5:30-AM-8 AM	8 AM – 4PM	4PM-11PM
Weekday	10 people	6 people	20 people
Weekend	10 people	40 people	20 people

During a visit to the machine room, the supply brine temperature was 14°F and the return brine temperature was 16°F. Based on the brine supply and return temperature, it is estimated that the rink ice temperature is about 18°F. The ice is resurfaced once an hour during youth hockey. During varsity hockey games the ice is resurfaced after every period, which comes out to 3 times every 2 hours.

Eversource provides both the electric and natural gas service to the O'Brien ice rink.

Architectural

The building is rectangular in shape with long sides facing east and west. The ice rink space is located on the west side of the building. The ice rink space is 220 ft long, 120 ft wide and 24 ft high. The top half of the exterior wall on the west side of the ice rink space is covered with 3" continuous polystyrene insulation. Other exterior walls in the building are assumed to have insulation that meets ASHRAE-2007 code specifications.

The construction of the roof consists of a white membrane roofing with approximately 3" of polyisocyanurate insulation (overall R-value of approximately 21 is assumed) on a built up roof deck. The rink has a low-e ceiling coating installed.

There are no exterior windows in the ice rink space.

Mechanical Systems

Airside system

The ice rink is served by a Bry-air VFB-50-G gas desiccant dehumidifier with 5,000 CFM capacity. It is assumed that the relative humidity level is maintained below 50% relative humidity. It is assumed that the unit is using 100% outside air to meet minimum ventilation requirements for sports arenas.

Refrigeration system

The O'Brien ice rink currently uses an older, 150 ton capacity, semi-hermetic chiller that uses R-22 refrigerant. The rink managers would like to completely replace this chiller.

Heat rejection for the chiller is provided by two Evapco LSCB-80 evaporative condensers. Each condensing unit has a fan with 7.5 hp that circulates 12,800 CFM of air.

Lighting Systems and Equipment Loads

The lighting for the ice rink surface consists of 21 clusters of six T-5 fluorescent lighting fixtures arranged in a star pattern. These fixtures each contain two T5 high output bulbs and consume an estimated 103 W per fixture. There are also 42 T-8 fixtures that provide additional lighting for the bleacher sections and the team seating areas. Each T-8 fixture is estimated to consume 70 W based on lighting documents provided by the ice rink manager. Based on this information, the lighting power density (LPD) of the ice rink space is estimated to be 0.603 W/sf.

When the rink is open, the T-5 lights illuminating the ice rink are always on 100%. For the most part, only 75% of the T-8 lights are running. When there is a varsity hockey game, all of the lights are turned on.

The LPD for the rest of the building is assumed to be about 1.0 W/sf. Equipment plug loads in the office space are estimated to be 1.5 W/sf.

Domestic Hot Water System

The energy use associated with domestic water heating was not evaluated or included in the analysis presented in this report since this energy end use is entirely independent of the energy uses that were the subject of this TA study.

ANALYSIS METHODOLOGY AND BASELINE DESIGN DESCRIPTION

To analyze future energy consumption patterns of the O'Brien ice rink and the efficiency of the energy conservation measures proposed for the building, a computer model of the facility was developed and building consumption simulations were performed using the eQuest building analysis program. eQuest uses the latest DOE-2.2 building energy analysis software as its calculating engine. This very flexible program permits modeling of a variety of building types and components including complex building geometry, lighting systems, HVAC systems, central plant equipment, and utility rate structure.

The eQuest model was compiled using information obtained from the refrigeration design engineer (Recco), a site walkthrough conducted by ALE, and information obtained from the building operators and the building owner representatives. Boston, MA weather data (in TMY2 format) was used in the analysis. Electric utility cost and cost savings were calculated using the Eversource G8 rate. The thermal energy cost and cost savings were calculated using the Eversource G42 rate.

Initially a model of the existing building was created. The high efficiency chiller ECM is a complete replacement of the existing system, so it would not be appropriate to compare the proposed chiller to the existing chiller. Instead, a suitable baseline chiller system consistent with current manufacturer's standard efficiency units was specified by Recco Inc. for comparison with the high efficiency proposed chiller system. Other components of the baseline model match the existing conditions at the rink.

The utility meters for the O'Brien ice rink are tied into the neighboring middle school, Daniel Joyce Middle School. Typically, the results of the energy model are compared to measured utility data to validate the accuracy of the model. In this particular case, analyzing the energy consumption of the school in order to isolate the energy consumption of the ice rink is outside the scope of this study.

Cost estimates were prepared using information provided by equipment vendors, Recco Inc., and experience from similar projects.

ENERGY CONSERVATION MEASURES

This section contains a description of the ECM that was evaluated and is presented for the utility incentive applications. Several eQuest output reports for the measure are included in Appendix A.

- ECM #1: High efficiency brine chiller

ECM # 1: High efficiency brine chiller

Summary of Savings and Economic Results for ECM # 1									
High Efficiency Brine Chiller	Electricity				Natural Gas		Total Cost Savings	Measure Increment	Simple Payback
	kWh	kW		\$	Therms	\$			
	127,530	winter	summer	\$18,846	960	\$407	\$19,253	\$109,237	5.7
	40	20							

Measure Description

This measure analyzes the benefits of installing a new high efficiency brine chiller for the ice rink refrigeration system. The existing chiller is nearing the end of its useful life, and a complete replacement is necessary. In addition to the age of the chiller, the current system uses R-22 refrigerant which is in the process of being phased out by the EPA due to its harmful effect on the O-zone layer.

The new chiller will include a controls system that allows the rink operators to keep the ice at a higher temperature without sacrificing ice quality. Raising the ice temperature from 18°F to 20°F will reduce the load on the refrigeration system. The controls for the ice temperature will also include a night time reset temperature when the rink is unoccupied. From 11:00 PM to 5:00 AM the ice temperature is set to 24 °F. Raising the ice temperature will also make it slightly easier for the heating system in the ice rink to maintain a 40°F temperature set point, which will reduce natural gas consumption.

The enhanced control system includes temperature sensors embedded in the concrete slab to more accurately determine the ice temperature. The brine pumps will be controlled to only operate when the chiller is in operation.

Base Case:

The baseline chiller system used in this study is a system that is consistent with current manufacturer's standard efficiency refrigeration systems using evaporative condensing units and R-134A refrigerant. The electrical performance and pricing information was provided by Recco, Inc. The baseline chiller uses two compressors and has a capacity of 111.5 tons and an electric efficiency of 1.425 kW/ton when operating with a supply brine temperature of 14°F and condensing temperature of approximately 101.5°F. The minimum condensing temperature is set to 85 °F. The lowest brine temperature input allowed by eQuest is 20°F, but the electrical efficiency used in the model is for 14°F. The product specification sheet for the baseline chiller is presented in Appendix B. The baseline chiller does not include an upgraded control system so the temperature of the ice is set to 18°F to ensure high quality ice. The baseline chiller is controlled off of the brine return temperature. This requires the brine pump to operate continuously when the ice rink is open.

Proposed Case:

The proposed high efficiency chiller uses two compressors and has a capacity of 111.16 tons and an electric efficiency of 1.056 kW/ton when operating with a supply brine temperature of 14°F and condensing temperature of 90°F. The minimum condensing temperature is set to 70 °F. Custom EIR curves as a function of brine temperature and condensing temperature were provided by Recco, Inc. The proposed system will also use evaporative condensing units and R-507 refrigerant. The product specification sheet for the proposed chiller, along with the custom curve data points are presented in Appendix B. The proposed chiller includes an upgraded control system that allows the ice temperature to be set to 20°F. The controls system is also linked to the brine pump so that the pump only runs when the chiller is operating.

Savings and Costs Summary

Energy End Use Summary	Electric (kWh)							Natural Gas (Therms)	
	Area Lights	Misc Equip	Space Cooling	Pumps & Aux.	Vent Fans	Heat Rejection	Total	Space Heating	Total
Baseline	231,842	4,537	304,482	104,451	49,631	21,003	715,946	29,389	32,251
High Efficiency Brine Chiller	231,842	4,537	200,301	74,498	49,629	27,609	588,416	28,531	31,293
Savings	0	0	104,181	29,953	2	-6,606	127,530	858	958
% Savings	0.0%	0.0%	34.2%	28.7%	0.0%	-31.5%	17.8%	2.9%	3.0%

Savings Calculation Methodology

The baseline and proposed chiller electric efficiencies were used in their respective models to calculate the electrical savings. The baseline chiller has a rated electric efficiency of 1.425 kW/ton (0.4052 EIR), and the proposed chiller has a rated electric efficiency of 1.056 kW/ton (0.300 EIR). In the baseline model, the rated and design condensing temperature is set to 101.5°F, with a minimum condensing temperature of 80°F. In the proposed model, the rated and design condensing temperature is set to 90°F, with a minimum condensing temperature of 70°F. The baseline system keeps the ice at 18°F, and in the proposed system the ice temperature is raised to 20°F. The proposed system sets the ice temperature to 24°F at night when the rink is closed.

In the baseline model the brine pump operates on a 24/7 schedule when the rink is open. For the proposed model the brine pump only runs when the chiller is running.

The baseline model uses a default eQuest EIR curve as a function of brine temperature and condensing temperature for an electric screw chiller. The proposed model uses a custom EIR curve as a function of brine temperature and condensing temperature that was provided by Recco, Inc.

Non-Electric Benefits/Non-Gas Benefits

This measure will yield small natural gas savings due to reduced load on the heating system from raising the ice temperature from 18°F to 20°F. The proposed system will use R-134A refrigerant, which is less harmful to the O-zone than the current system that uses R-22 refrigerant.

Cost Estimate

The cost of the baseline chiller is estimated to be \$95,000 and the cost of the proposed high efficiency chiller is estimated to be \$204,237. Therefore the total incremental cost of the measure is estimated to be \$109,237.

Source of Estimate

The cost information for the replacement chiller was provided by Recco, Inc. A detailed breakdown of the estimate is provided in Appendix C with the product specification sheet.

Appendix A: Minimum Requirements Documents

Minimum Requirements Document

Customer Name	O'Brien Ice Rink	New Const.	
Location	Woburn, MA	Application #:	
ECM:	High Efficiency Brine Chiller		

The Technical Assistance Contractor or the customer's engineer or designer is to specify herein minimum equipment and operational requirements of the proposed system. These requirements shall address the criteria necessary to be met to achieve the demand and energy savings estimated in the engineering analysis for this project. Testing and submittals may be required as further verification of system compliance. *(Use additional sheets, if necessary.)* These requirements must be met before the Company's Incentives are paid.

EQUIPMENT REQUIREMENTS: Provide a list of equipment or material to be installed as part of this project. Include manufacturer, model, HP or kW ratings, efficiency rating, etc:

Post-Installation Inspection Record (check one) OK Not OK

Provide one high efficiency condenser-less brine chiller with two screw compressors. The unit shall be a Liqui-Chill Industrial Rink Chiller Model # LCRNK-DOSWMW200-57-4, or equal with nominal capacity of 111.16 tons. The chiller shall have full-load efficiency of 1.056 kW/ton at design conditions of 17°F entering brine (40% ethylene glycol) temperature, 14°F leaving brine temperature, and at 90°F condensing temperature.

OPERATIONAL SEQUENCES REQUIREMENTS: Provide a description of equipment operating sequences, set points, operating schedules, balancing requirements (such as flow, velocity, head, suction, etc.) or any other operating parameters to obtain the estimated electric energy savings.

Post-Installation Inspection Record (check one) OK Not OK

The brine water supply temperature shall be maintained at 14°F or higher. The chiller capacity shall be staged in two steps. The chiller shall be controlled by temperature sensors embedded in the concrete slab. The brine pump will only operate when the chiller is running. The minimum condensing temperature is 70°F.

DOCUMENTATION: List any documentation that should be required to verify, operate or maintain the equipment being installed or controlled. This information may include equipment specification sheets, test reports, construction drawings, sequence of operation, etc.

Post-Installation Inspection Record (check one) OK Not OK

Complete submittals for the chiller shall be forwarded to Eversource.

OTHER REQUIREMENTS OR COMMENTS: Describe any requirements for demolition, removal, or decommissioning of existing equipment.

Post-Installation Inspection Record (check one) OK Not OK

N/A

The pre-approved incentive is subject to the Company's post-installation inspection of final specifications, drawings and operation of the proposed equipment. In the event the proposed system is altered from the above description, notify the Company of the change prior to the equipment purchase and installation as the change in design and operation may impact the incentive.

Pre Installation:

_____	_____	_____	_____
Eversource Signature	Date	Technical Representative	Date

Post Installation:

_____	_____	_____	_____
Eversource Signature	Date	Technical Representative	Date

Appendix B: Miscellaneous Supporting Data

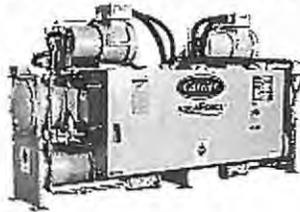
Summary Performance Report For CH-1

Project: ~Untitled3
 Prepared By:

05/23/2016
 09:38AM



AquaForce™ Condenserless Screw Chiller



Unit Information

Tag Name:.....CH-1
 Model Number:.....30HXA206
 Quantity:.....1
 Manufacturing Source:.....Charlotte, NC USA
 Independent Refrigerant Circuits:.....2
 Capacity:.....111.5 Tons
 Comp. Input Power:.....158.9 kW
 Unit Input Power:.....158.9 kW
 Capacity control steps:.....11
 Minimum Capacity:.....10.0 %
 Input:.....1.425 kW/Ton
 Unit EER:.....8.42
 Refrigerant:.....R134A
 Shipping Weight:.....7823 lb
 Operating Weight:.....7485 lb
 Unit Length:.....151 in
 Unit Width:.....36 in
 Unit Height:.....74 in

Evaporator Information

Fluid Type:.....Ethylene Glycol
 Brine Concentration:.....35.0 %
 Fluid Entering Temperature:.....17.0 °F
 Fluid Leaving Temperature:.....14.0 °F
 Fluid Flow Rate:.....1011.0 gpm
 Fluid Pressure Drop:.....73.4 ft wg
 Fluid Velocity:.....10.7 ft/s
 Fouling Factor:.....0.00010 (hr-sqft-F)/BTU
 Fouling Factor Temp Adj.:.....0.30 °F
Saturated Suction Temp.
 Circuit A:.....11.4 °F
 Circuit B:.....10.9 °F
 Outside Surface Area:.....418.9 sqft

Condenser Information

Saturated Discharge Temp.
 Circuit A:.....105.0 °F
 Circuit B:.....105.0 °F
Saturated Condensing Temp.
 Circuit A:.....101.9 °F
 Circuit B:.....101.2 °F
Subcooling
 Circuit A:.....15.0 °F
 Circuit B:.....15.0 °F
Total Heat Rejection
 Circuit A:.....85.4 Tons
 Circuit B:.....64.5 Tons
 Disch. Line Loss:.....2.0 °F
Saturated Discharge Temp.
 Circuit A:.....105.0 °F
 Circuit B:.....105.0 °F

Accessories and Installed Options

Min Load Control (to 10% capacity)
 Low Leaving Water Temp Option (Brine)
 Nitrogen Holding Charge, Standard Cooler Pass
 Across Line Start

Remote Condenser Accessories and Installed Options

No Accessories or Installed Options selected

O'Brien Proposed Chiller Specs

Subject: **LIQUI-CHILL** Dual Circuit High Efficiency Ice Rink Chiller for Evaporative Condensing

Design Specifications

Chiller Designed for Dual Circuit Operation, Cooling Tower by others.
System capacity 111.16 Tons with 163.32 BHP, 81.66 BHP each.
R-507 Refrigerant
Compressor (Two Bitzer Direct Drive Screw Compressors, 100 HP Motors 3500 RPM)
5F Suction Temperature
90F Condensing Temperature, Compressor THR each 861,000 btuh, Total 1,722,000 btuh
Liquid Temp from Economizers 70.3F
One Dual Circuit ChilCon Ice Rink Duty Shell & Tube Chiller Evaporator.
Glycol Flow Rate through evaporator 966 GPM @ 9.9 psi pressure drop
17F entering Ethylene Glycol 40% Solution.
14F leaving Ethylene Glycol 40% Solution.
Two remote high pressure receivers, each dedicated to an evaporative condenser
Compressors Power requirements 480 volt 3 phase 60hz Two 200 amp Power Feeds
Compressors Load at Design Condition RLA 236, FLA 248 , Total kW 121.8, 1.09 kW/Ton
Compressors EER 10.95

Equipment to be provided.

LIQUI-CHILL Industrial Ice Rink Chiller Model # LCRNK-DOSWMW200-57-4

Chiller includes, Two independent refrigerant circuits, two independent electrical circuits, one dual circuit Shell & Tube Chiller Evaporator, two high pressure receivers, three Nema 12 control panels two with indicating lights, one with Microprocessor and keypad display, two 100 HP Soft Starters, one welded & painted heavy duty steel frame all pre-packaged at the factory.

Chiller Standard Features

Micro Controls Microprocessor with Door mounted Key Pad Display, includes Nema 12 Enclosure, I/O Boards, Transducers for suction, discharge, oil pressure, Temp Sensors for, Suction, discharge, oil, Glycol in & out, Ice Floor, amps, low voltage and phase loss. Electronic Expansion Valve Control and Remote Access capability via Modem Connection.

Two Bitzer Direct Drive Screw Compressors 100 HP PE Motors. (OSK7471-K)
Two Discharge Line Heated Oil Separators with Oil return Solenoids and Stop Valves.
Two in line changeable element Oil Filters.
Two Eco Line Mufflers.
Two Brazed Plate Sub Coolers with TXV and Solenoid Valves. (LCSC14DXD)
One Dual Circuit Shell & Tube Chiller Evaporator for Ice Rink Duty. (ChilCon)(ERC24168420)
Two High Pressure Receivers with valves
Two Suction Accumulators.
Two 1 1/8" Changeable Core Liquid Line Driers and Sight Glasses.
Chilled Water No Flow Pressure Switch.

Two 1 1/8" Liquid Line Solenoid Valves.
Two 1 1/8" Liquid Line Ball Valves.
Two Sporlan Electronic Expansion Valves, designed for low head operation.
Two Nema 12 Control Panels with Transformers, Relay's, Soft Starters, Control Power light & Switches, Pump Down light & Switches, Compressor light & Switches and lockable keyed latch.
Micro output for Tower Fan VFD Control..

Electrical Distribution

Requires two 200 amp 460 volt 3 phase 60 hz power feeds for the chiller unit.

All electrical panels are mounted on the chiller and prewired including,
Two compressor panels and one Microprocessor panel.

Exclusions

No Taxes, Permits, or Certifications are included.

Evaporative Condensers, Pumps or Rink Chiller Pumps are Not Included.

Delivery of Chiller and Equipment.

Approximately 12 to 14 weeks from Signed Contract and Deposit. Delivery may change based on Backlog at time of Order

Warranty

One Year Parts and 90 Day Labor Warranty Included.

Start Up Required for Warranty \$105.00 per hour plus expenses.

LIQUI-CHILL Industrial Ice Rink Chiller Model #LCRNK-DOSWME200-57-4 \$196,593.00.

Dimensions 192" x 72" x 80" high, weight approx., 14,500 lb.

Options

Two Desuperheaters 150,000 btuh each. \$3,822.00 **\$7,644.00**

Terms 50% Deposit with Signed Contract, 30% Progress Payment 60 Days from Deposit, and 10% at delivery of equipment, Prior to Start Up
10% after completion Net 30 Days. Deposit is Non Refundable.

Total Price \$196,593.00

Total Price with Options \$204,237.00

All Equipment is F.O.B. Pittsburgh, PA.

Note ! Dedicated Phone Line Required for Start Up & Warranty.

O'Brien Rink - Woburn, MA

Proposed Case Chiller Performance at Varying Conditions

Brine Temp (°F)	Condensing Temp (°F)	TR (each compressor)	KW (each compressor)	KW/TR	EIR	Normalized EIR
12	70	59.92	47.8	0.797775	0.226834	0.755418833
12	80	57.83	53.8	0.930259	0.264504	0.880869569
12	90	55.50	60.6	1.091892	0.310461	1.03392062
14	70	62.25	48	0.771084	0.219245	0.730145541
14	80	60.17	54.1	0.899169	0.255664	0.851429845
14	90	57.67	60.9	1.056069	0.300276	1
16	70	64.67	48.3	0.746907	0.212371	0.707252044
16	80	62.50	54.3	0.8688	0.247029	0.822673235
16	90	59.92	61.1	1.01975	0.289949	0.965608592

Notes

1. Compressors are Bitzer OSK7471-K units running at 3500 rpm with 0°F subcooling at the condenser, economizer with automatic subcooling and 14°F suction gas superheat

Appendix C: Custom Application

NEW CONSTRUCTION

2016 Custom Application

ALL FIELDS ON THIS PAGE ARE REQUIRED TO COMPLETE YOUR APPLICATION.

Indicate Program Administrator for Application: Cape Light Compact Eversource National Grid Unitil



CUSTOMER/ACCOUNT HOLDER INFORMATION

COMPANY NAME Town of Woburn	CONTACT PERSON Terry McLaughlin	APPLICATION DATE 8/30/2016
INSTALL SITE O'Brien Rink	PHONE (603) 686-0423	FAX NUMBER
EMAIL ADDRESS mmd.consultants@comcast.net	SQUARE FEET (COVERED BY THIS APPLICATION) 26,400	
STREET ADDRESS 55 Locust Street #3	CITY Woburn	STATE MA
		ZIP 01801
MAILING ADDRESS (IF DIFFERENT) P.O. Box 45	CITY Exeter	STATE NH
		ZIP 03833
ELECTRIC COMPANY NAME Eversource (Eastern MA)	ELECTRIC ACCOUNT NUMBER 2612-490-1005	
GAS COMPANY NAME Eversource	GAS ACCOUNT NUMBER	

BUILDING TYPE (PLEASE PLACE "X" IN APPROPRIATE BALLOT BOX)

<input type="checkbox"/> ASSEMBLY	<input type="checkbox"/> FAST FOOD	<input type="checkbox"/> HOTEL	<input type="checkbox"/> MULTI STORY RETAIL	<input type="checkbox"/> RELIGIOUS	<input type="checkbox"/> SMALL RETAIL
<input type="checkbox"/> AUTOMOTIVE	<input type="checkbox"/> FULL SERVICE RESTAURANT	<input type="checkbox"/> LARGE REFRIGERATED SPACE	<input type="checkbox"/> MULTIFAMILY HIGH-RISE	<input type="checkbox"/> K-12 SCHOOL	<input type="checkbox"/> UNIVERSITY
<input type="checkbox"/> BIG BOX	<input type="checkbox"/> GROCERY	<input type="checkbox"/> LARGE OFFICE	<input type="checkbox"/> MULTIFAMILY LOW-RISE	<input type="checkbox"/> SMALL OFFICE	<input type="checkbox"/> WAREHOUSE
<input type="checkbox"/> COMMUNITY COLLEGE	<input type="checkbox"/> HEAVY INDUSTRIAL	<input type="checkbox"/> LIGHT INDUSTRIAL	<input checked="" type="checkbox"/> OTHER:		
<input type="checkbox"/> DORMITORY	<input type="checkbox"/> HOSPITAL	<input type="checkbox"/> MOTEL	Ice Rink		

PROJECT TYPE (select one)

<input type="checkbox"/> CHANGE IN THE USE OR FUNCTION OF THE BUILDING SPACE	<input type="checkbox"/> NEW BUILDING	<input type="checkbox"/> EXPANSION OF AN EXISTING BUILDING	<input type="checkbox"/> PLANNED REPLACEMENT OF EQUIPMENT
<input type="checkbox"/> NEW EQUIPMENT FOR NEW PROCESS OR EXPANDED OPERATION	<input type="checkbox"/> RENOVATION OF EXISTING EQUIPMENT	<input type="checkbox"/> NEW CONTROLS FOR IMPROVED OPERATIONS	<input type="checkbox"/> REPLACEMENT OF FAILED EQUIPMENT

PAYMENT METHOD (PAYEE MUST SUBMIT A W-9 FORM)

PAYMENT TO: <input type="checkbox"/> CUSTOMER <input type="checkbox"/> VENDOR/INSTALLER	CUSTOMER - TAX ID# (REQUIRED)	VENDOR/INSTALLER - TAX ID# (REQUIRED IF RECEIVING INCENTIVE)
CHECK PAYABLE TO:	CUSTOMER COMPANY TYPE: <input type="checkbox"/> INC. <input type="checkbox"/> NOT INCORP. <input type="checkbox"/> EXEMPT	VENDOR COMPANY TYPE: <input type="checkbox"/> INC. <input type="checkbox"/> NOT INCORP. <input type="checkbox"/> EXEMPT

VENDOR INFORMATION

VENDOR/INSTALLER	CONTACT NAME
STREET ADDRESS	CITY
	STATE
	ZIP
PHONE	EMAIL ADDRESS
DATE	VENDOR/INSTALLER AUTHORIZED SIGNATURE (NOT APPLICABLE IF CUSTOMER IS PAYEE) X

CUSTOMER ACCEPTANCE OF TERMS

PRE-INSTALLATION	<input type="checkbox"/> I CERTIFY THAT ALL STATEMENTS MADE IN THIS APPLICATION ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND THAT I HAVE READ AND AGREE TO THE TERMS AND CONDITIONS ON THE BACK OF THIS FORM.	ANTICIPATED COMPLETION DATE
DATE	PRINT NAME	AUTHORIZED SIGNATURE X
POST-INSTALLATION	<input type="checkbox"/> I CERTIFY THAT I HAVE SEEN THE ENERGY EFFICIENCY MEASURES THAT HAVE BEEN INSTALLED AND I AM SATISFIED WITH THEIR INSTALLATION.	
DATE	PRINT NAME	AUTHORIZED SIGNATURE X

FOR PROGRAM ADMINISTRATORS ONLY

REQUIRED INSPECTIONS	DATE	INSPECTOR	PROJECT COSTS:
PRE-INSPECTION:			
POST INSPECTION:			
APPROVAL	DATE	PROGRAM MANAGER	LABOR \$:
PRE-APPROVED INCENTIVE:			
FINAL INCENTIVE:			MATERIAL \$:

Electric Program Administrators



Cape Light Compact
P.O. Box 427
Barnstable, MA 02630
Tel: 1-800-797-6699
www.capelightcompact.org
efficiency@capelightcompact.org

EVERSOURCE

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Westwood, MA 02090
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www.eversource.com
efficiencyma@eversource.com

Western Massachusetts:
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Springfield, MA 01104
Tel: 1-844-887-1400
www.eversource.com
efficiencywmass@eversource.com

nationalgrid

HERE WITH YOU. HERE FOR YOU.

National Grid
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Tel: 1-800-787-1706
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GAS Program Administrators



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A NISource Company
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nationalgrid

HERE WITH YOU. HERE FOR YOU.

National Grid
Tel: 1-800-787-1706
www.nationalgridus.com
efficiency@nationalgrid.com



Unitil
Tel: 1-888-301-7700
www.unitil.com
efficiency@unitil.com

Custom Measure Application Process

1. All applications for incentives under the Custom Application Process require sound documentation of the proposed cost, projected electricity and/or natural gas savings and the related non energy savings.
2. Before starting the application process, check with your Program Administrator to determine eligibility of the proposed project and to establish requirement for detailed savings projections and cost estimates.
3. This information will be submitted to Program Administrator's Technical Representative for review and evaluation of potential incentives.
4. The Technical Representative will develop a Minimum Requirements Document which describes the minimum equipment specifications and operational requirements of the proposed system. The Customer will be required to sign this document.
5. After successful review and project approval, the Program Administrator will notify customer in writing of the project approval, the incentive amount and the terms and conditions required to receive final incentive payment.
6. The following is a guide to the level of technical information and documentation that is typically required.

Project Description

- General description of facility, it's use and typical operation (include occupancy schedules)
- Overall project description including operating schedules and parameters

Base Case Materials and Equipment (Applicable for expansion or equipment replacement projects)

- Detailed description of equipment and operations
- Cuts sheets with equipment performance ratings (BHP, CFM, BTU/H, kW, etc.). Provide nameplate data if cut sheets are unavailable
- Part load performance data where applicable
- Description of controls and sequence of operations

Proposed Materials and Equipment

- Detailed description of equipment and operations
- Cuts sheets for the materials or performance ratings for equipment being installed (BHP, CFM, PSI, Efficiency rating, U-value, Lumens, etc)
- Description of controls and sequence of operations

Load Profile

- Equipment hours of operation (operating schedule per day, week, year)
- Provide operating load profiles showing how equipment load and operating parameters vary over time due to changes in: occupancy, weather, production, etc.
- Where there are existing systems involved, metering kW and kWh of major equipment loads is recommended. If metered information is not available, provide other documentation used to estimate loads and operating hours.

Savings Calculations

- Show calculations used to determine electricity and/or natural gas savings.
- The calculations should clearly show all the details of how the energy savings were estimated. This includes all engineering formulas and documentation of all the factors, values and assumptions used in the formulas (spreadsheet preferred)
- In cases where energy modeling is used to determine savings, approved modeling software must be used. Input and output data from the model must be provided.

See Table 1E and Table 1G on page 4 for the specific details of the data required.

The following form may be filled out for preliminary project submittal and review, but a final Custom Project information package must also be submitted in electronic format. Contact a Program Administrator's Technical Representative for details.

Proposed Equipment Specification (Facility Detail)

BUILDING, ROOM AND EQUIPMENT IDENTIFICATION (Installation Site) O'Brien Ice Rink

DESCRIPTION OF PROJECT:

This measure analyzes the benefits of installing a new high efficiency brine chiller for the ice rink refrigeration system. refrigerant which is in the process of being phased out by the EPA due to its harmful effect on the O-zone layer. The new chiller will also include a controls system that allows the rink operators to keep the ice at a higher temperature without sacrificing ice quality. Raising the ice temperature from 18°F to 20°F will reduce the load on the refrigeration system. The enhanced control system includes temperature sensors embedded in the concrete slab. The brine pumps will be controlled to

Base System: Measure Description

The baseline chiller system used in this study is a system that is consistent with current manufacturer's standard efficiency refrigeration systems using evaporative condensing units and R-134A refrigerant. The baseline chiller uses two compressors and has a capacity of 111.5 tons and an electric efficiency of 1.425 kW/ton when operating with a supply brine temperature of 14°F and condensing temperature of approximately 101.5°F. The minimum condensing temperature is set to 80°F. The baseline chiller does not include an upgraded control system so the temperature of the ice is set to 18°F to ensure high quality ice. The baseline chiller is controlled off of the brine return temperature. This requires the brine pump to operate continuously when the ice rink is open. Please refer to the full TA study report for more information.

Proposed System: Measure Description

The proposed high efficiency chiller uses two compressors and has a capacity of 111.16 tons and an electric efficiency of 1.056 kW/ton when operating with a supply brine temperature of 14°F and condensing temperature of 90°F. The minimum condensing temperature is set to 70°F. The proposed system will also use evaporative condensing units and R-507 refrigerant. The proposed chiller includes an upgraded control system that allows the ice temperature to be set to 20°F. The controls system is also linked to the brine pump so that the pump only runs when the chiller is operating. Please refer to the full TA study report for more information.

Manufacturer Incentives, Manufacturer Discounts, Taxes, and/or Salvage Values

INTERNAL USE ONLY:

MEASURE CODE _____ **MEASURE DESCRIPTION** _____

Important VSD Information

VSDs can be sensitive to over-voltages that occur when power factor correcting capacitor banks on the utility power system are switched on. To qualify for an incentive payment, each VSD must include a series reactor (inductor, choke) in its AC input connections. Your VSD supplier should assist in the sizing of the reactor. Minimum recommendation is a 3% impedance reactor, based on the horsepower of the VSD to be installed.

In some instances your supplier may find it necessary to install 5% reactors and, rarely, additional filtering devices to meet acceptable current and voltage harmonic distortion requirements.

If your power factor is less than 0.8 (80%), we recommend that you consider power factor correction concurrent with the installation of drives.

The use of VSDs which incorporate pulse width modulation (PWM) may produce over-voltages which may cause premature failure of AC induction motors not rated for use with an inverter. We recommend that when installing PWM drives, you consider utilizing inverter rated motors.

Table 1E: Electric Energy (kWh) and Demand (kW) Reduction

Please provide the total Electric Energy (kWh) and Demand (kW) reduction that occurs during the time periods listed below.

	kWh				Total Percent Energy Savings on Peak ***	
	Summer		Winter			
Peak Energy	12,430	kWh	44,607	kWh	44.72%	%
Off-Peak Energy	15,967	kWh	54,526	kWh		
Total Estimated Annual kWh Savings**					127,530	kWh

	kW				
	June	July	August	December	January
Average Peak*	0	6.3	13.4	19.8	19.9

Estimated Savings with Calculations: Provide Calculations that show the following:

1. First Year kWh savings (annual)
2. Winter Peak Energy kWh: 7AM – 11PM, weekdays except holidays, October to May
3. Winter Off-Peak Energy kWh savings: 11PM – 7AM weekdays, all day weekends and holidays, October to May
4. Summer Peak Energy kWh savings: 7AM – 11PM, weekdays except holidays, June to September
5. Summer Off-Peak Energy kWh savings: 11PM – 7AM weekdays, all day weekends and holidays, June to September
6. Summer Average Demand kW reduction: 1PM – 5 PM, weekdays except holidays, June to August
7. Winter Average Demand kW reduction: 5PM – 7 PM, weekdays except holidays, December and January

*** Average Peak kW:**

Example: Assume the demand savings is 10 kW whenever a plant is in operation and the plant shuts down at 6pm, then the average demand reduction in winter is 5 kW (10 kW ÷ 2 hours = 5 kW)

**** Total Estimated Annual kWh Savings:** The sum of all the Summer and Winter Peak and Off-Peak kWh Savings

***** Total Percent Energy Savings on Peak:** The sum of the Summer and Winter Peak kWh divided by the Total Annual kWh Savings

Table 1G: Gas Energy (Therm) Reduction

Annual Gas Savings Inputs (Therms)			
Heating (Seasonal)	Process / Hot Water (Non-Heating)	Other (Year Round)	Total
960			960

Cost Estimates

Provide back-up documentation for all material and labor costs, broken down by major pieces of equipment and project components. Sales tax may not be included. Adjust for salvage/resale value of equipment being replaced. Enter summarized costs in the table below.

Table 2: Cost Estimates

Measure	Cost (\$)
Estimated Incremental Material Cost	\$87,390.00
Estimated Incremental Labor Cost	\$21,847.00
Estimated Incremental Total Cost	\$109,237.00

Non-Energy Benefits and Effects

Installing the proposed measure may result in significant savings or possibly increased costs for the owner beyond electric and natural gas savings. Examples include water, sewer, fossil fuel and labor costs. These costs are to be assessed and quantified in the support documentation. These effects are to be combined and reported in the categories provided in Table 3.

Table 3: Other Benefits Summary

Non-Electric, Non-Gas Benefits					
Oil (MMBtu)	Propane (MMBtu)	Water (Gallons)	Sewer (Gallons)	Annual O&M / Labor / Materials (\$)	Other One-Time (\$)

Appendix D: eQuest Output Summary Table

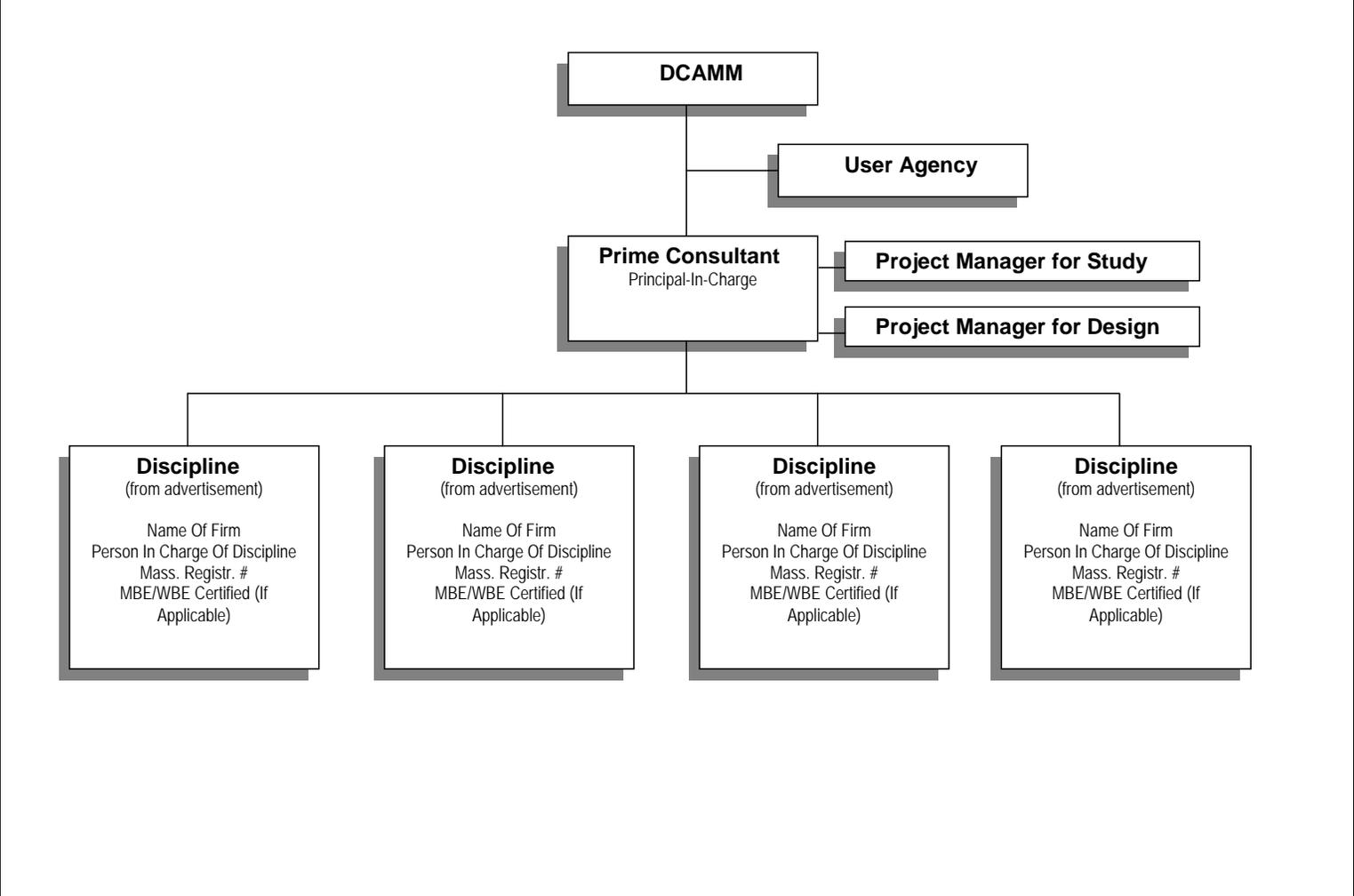
Electric Consumption	Baseline	High Efficiency Brine Chiller
Area Lights	231,842	231,842
Misc Equip	4,537	4,537
Space Heating	0	0
Space Cooling	304,482	200,301
Heat Rejection	21,003	27,609
Pumps & Aux.	104,451	74,498
Vent Fans	49,631	49,629
Heat Pump Supplemental	0	0
Calculated Total	715,946	588,416
Outputed Total	715,945	588,415
Cost (\$)	\$122,615	\$103,769
Cost (\$/kWh)	0.17	0.18
Savings (kWh)	--	127,530
Savings (\$)	--	\$18,846
Savings (\$/kWh)	--	0.15

Natural Gas Consumption	Baseline	High Efficiency Brine Chiller
Misc Equip	0	0
Space Heating	29,389	28,531
Space Cooling	2,862	2,762
Pumps & Aux.	0	0
Domestic Hot Water	0	0
Calculated Total	32,251	31,293
Outputed Total (Therms)	32,252	31,292
Cost (\$)	\$14,460	\$14,053
Cost (\$/Therm)	0.45	0.45
Savings (Therms)	--	960
Savings (\$)	--	\$407
Savings (\$/Therm)	--	0.42
Total Cost (\$)	\$137,075	\$117,822
Total Savings (\$)	--	\$19,253

APPENDIX B
DESIGNER APPLICATION FORM

Commonwealth of Massachusetts DSB Application Form (Updated May 2014)	1. Project Name/Location for Which Firm is Filing:	2a. DSB #	Item #
		2b. Mass. State Project #	
3a. Firm (Or Joint-Venture) - Name and Address Of Primary Office To Perform The Work:	3e. Name Of Proposed Project Manager: For Study: (if applicable) For Design: (if applicable)		
3b. Date Present and Predecessor Firms Were Established:	3f. Name and Address Of Other Participating Offices Of The Prime Applicant, If Different From Item 3a Above:		
3c. Federal ID #:	3g. Name and Address Of Parent Company, If Any:		
3d. Name and Title Of Principal-In-Charge Of The Project (MA Registration Required): Email Address: Telephone No:	3h. Check Below If Your Firm Is Either: (1) SDO Certified Minority Business Enterprise (MBE) <input type="checkbox"/> (2) SDO Certified Woman Business Enterprise (WBE) <input type="checkbox"/> (3) SDO Certified Minority Woman Business Enterprise (M/WBE) <input type="checkbox"/>		
4. Personnel From Prime Firm Included In Question #3a Above By Discipline (List Each Person Only Once, By Primary Function -- Average Number Employed Throughout The Preceding 6 Month Period. Indicate Both The Total Number In Each Discipline And, Within Brackets, The Total Number Holding Massachusetts Registrations):			
Admin. Personnel _____ ()	Ecologists _____ ()	Licensed Site Profs. _____ ()	Other _____ ()
Architects _____ ()	Electrical Engrs. _____ ()	Mechanical Engrs. _____ ()	_____ ()
Acoustical Engrs. _____ ()	Environmental Engrs. _____ ()	Planners: Urban./Reg. _____ ()	_____ ()
Civil Engrs. _____ ()	Fire Protection Engrs. _____ ()	Specification Writers _____ ()	_____ ()
Code Specialists _____ ()	Geotech. Engrs. _____ ()	Structural Engrs. _____ ()	_____ ()
Construction Inspectors _____ ()	Industrial Hygienists _____ ()	Surveyors _____ ()	_____ ()
Cost Estimators _____ ()	Interior Designers _____ ()	_____ ()	_____ ()
Drafters _____ ()	Landscape Architects _____ ()	_____ ()	Total _____ ()
5. Has this Joint-Venture previously worked together? <input type="checkbox"/> Yes <input type="checkbox"/> No			

6. List **ONLY** Those Prime and Sub-Consultant Personnel Specifically Requested In The Advertisement. This Information Should Be Presented Below In The Form Of An Organizational Chart. Include Name Of Firm and Name Of The One Person In Charge Of The Discipline, With Mass. Registration Number, As Well As MBE/WBE Status, If Applicable:



7. Brief Resume of ONLY those Prime Applicant and Sub-Consultant personnel requested in the Advertisement. <u>Include Resumes of Project Managers.</u> Resumes should be consistent with the persons listed on the Organizational Chart in Question # 6. Additional sheets should be provided only as required for the number of Key Personnel requested in the Advertisement and they must be in the format provided. By including a Firm as a Sub-Consultant, the Prime Applicant certifies that the listed Firm has agreed to work on this Project, should the team be selected.	
a. Name and Title Within Firm:	a. Name and Title Within Firm:
b. Project Assignment:	b. Project Assignment:
c. Name and Address Of Office In Which Individual Identified In 7a Resides: <div style="text-align: right;"> MBE <input type="checkbox"/> WBE <input type="checkbox"/> </div>	c. Name and Address Of Office In Which Individual Identified In 7a Resides: <div style="text-align: right;"> MBE <input type="checkbox"/> WBE <input type="checkbox"/> </div>
d. Years Experience: With This Firm: _____ With Other Firms: _____	d. Years Experience: With This Firm: _____ With Other Firms: _____
e. Education: Degree(s) /Year/Specialization	e. Education: Degree(s) /Year/Specialization
f. Active Registration: Year First Registered/Discipline/Mass Registration Number	f. Active Registration: Year First Registered/Discipline/Mass Registration Number:
g. Current Work Assignments and Availability For This Project:	g. Current Work Assignments and Availability For This Project
h. Other Experience and Qualification Relevant To The Proposed Project: (Identify Firm By Which Employed, If Not Current Firm):	h. Other Experience and Qualification Relevant To The Proposed Project: (Identify Firm By Which Employed , If Not Current Firm):

8a. Current and Relevant Work By Prime Applicant Or Joint-Venture Members. Include ONLY Work Which Best Illustrates Current Qualifications In The Areas Listed In The DSB Advertisement (List Up To But Not More Than 5 Projects).					
a. Project Name and Location Principal-In-Charge	b. Brief Description Of Project and Services (Include Reference To Areas Of Experience Listed In DSB Advertisement)	c. Client's Name, Address and Phone Number. Include Name Of Contact Person	d. Completion Date (Actual Or Estimated)	e. Project Cost (In Thousands)	
				Construction Costs(Actual, Or Estimated If Not Completed)	Fee For Work For Which Firm Was Responsible.
(1)					
(2)					
(3)					
(4)					
(5)					

8b. List Current and Relevant Work By Sub-Consultants Which Best Illustrates Current Qualifications In The Areas Listed In The Advertisement (Up To But Not More Than 5 Projects For Each Sub-Consultant). Use Additional Sheets Only As Required For The Number Of Sub-Consultants Requested In The Advertisement and They Must Be In The Format Provided.

Sub-Consultant Name:					
a. Project Name and Location Principal-In-Charge	b. Brief Description Of Project and Services (Include Reference To Areas Of Experience Listed In DSB Advertisement)	c. Client's Name, Address and Phone Number (Include Name Of Contact Person)	d. Completion Date (Actual Or Estimated)	e. Project Cost (In Thousands)	
				Construction Costs (Actual, Or Estimated If Not Completed)	Fee for Work for Which Firm Was Responsible
(1)					
(2)					
(3)					
(4)					
(5)					

9. List All Projects Within The Past 5 Years For Which Prime Applicant Has Performed, Or Has Entered Into A Contract To Perform, Any Design Services For All Public Agencies Within The Commonwealth.

# of Total Projects:		# of Active Projects:	Total Construction Cost (In Thousands) of Active Projects (excluding studies):		
Role P, C, JV *	Phases St., Sch., D.D., C.D.,A.C. *	Project Name, Location and Principal-In-Charge:	Awarding Authority (Include Contact Name and Phone Number)	Construction Costs (In Thousands) (Actual, or Estimated if Not)	Completion Date (Actual or Estimated) (R)Renovation or (N)New
		1.			
		2.			
		3.			
		4.			
		5.			
		6.			
		7.			
		8.			
		9.			
		10.			

* P = Principal; C = Consultant; JV = Joint Venture; St. = Study; Sch. = Schematic; D.D. = Design Development; C.D. = Construction Documents; A.C. = Administration of Contract

10. Use This Space To Provide Any Additional Information Or Description Of Resources Supporting The Qualifications Of Your Firm And That Of Your Sub-Consultants For The Proposed Project. If Needed, Up To Three, Double-Sided 8 1/2" X 11" Supplementary Sheets Will Be Accepted. **APPLICANTS ARE ENCOURAGED TO RESPOND SPECIFICALLY IN THIS SECTION TO THE APPLICATION EVALUATION - PROJECT EXPERIENCE REQUESTED IN THE ADVERTISEMENT.**

Be specific – No Boiler Plate

11. Professional Liability Insurance:

Name of Company	Aggregate Amount	Policy Number	Expiration Date

12. Have monies been paid by you, or on your behalf, as a result of Professional Liability Claims (in any jurisdiction) occurring within the last 5 years and in excess of \$50,000 per incident? Answer YES or NO. If YES, please include the name(s) of the Project(s) and Client(s), and an explanation (attach separate sheet if necessary).

13. Name Of Sole Proprietor Or Names Of All Firm Partners and Officers:

Name	Title	MA Reg #	Status/Discipline	Name	Title	MA Reg #	Status/Discipline
a.				d.			
b.				e.			
c.				f.			

14. If Corporation, Provide Names Of All Members Of The Board Of Directors:

Name	Title	MA Reg #	Status/Discipline	Name	Title	MA Reg #	Status/Discipline
a.				d.			
b.				e.			
c.				f.			

15. Names Of All Owners (Stocks Or Other Ownership):

Name and Title	% Ownership	MA Reg.#	Status/Discipline	Name and Title	% Ownership	MA Reg.#	Status/Discipline
a.				d.			
b.				e.			
c.				f.			

16. I hereby certify that the undersigned is an Authorized Signatory of Firm and is a Principal or Officer of Firm. I further certify that this firm is a "Designer", as that term is defined in Chapter 7, Section 38A1/2 of the General Laws, or that the services required are limited to construction management or the preparation of master plans, studies, surveys, soil tests, cost estimates or programs. The information contained in this application is true, accurate and sworn to by the undersigned under the pains and penalties of perjury.

Submitted By (Signature) _____ Printed Name and Title _____ Date _____

The following forms MUST be attached to only ONE (ORIGINAL Copy) application: 1. SDO Certification required for MBE/WBE Firms; 2. Sub-Consultant Acknowledgment.

DSB S-CA	Commonwealth of Massachusetts Designer Selection Board SUB-CONSULTANT ACKNOWLEDGMENT
-------------	--

Project: _____

Applicant Designer: _____

Sub-consultant: _____

SUB-CONSULTANT ACKNOWLEDGMENT

The sub-consultant named above hereby certifies that it has been notified by the Applicant Designer that it has been nominated to perform work on the Applicant Designer's team for the above Project, which is under consideration at the Designer Selection Board.

Signature of Sub-Consultant Duly Authorized Representative

Print Name and Title

Date _____

It is a requirement that all applicants supply this document signed, attached to the Original application, for each of the listed sub-consultants stating that they are aware and agree to being nominated by said applicant designer. Electronic signatures are accepted.

APPENDIX C
WOBURN SAMPLE CONTRACT AGREEMENT

CITY OF WOBURN

CONTRACT NO. 2016 -

Agreement entered into this ____ day of June, 2015 between the **City of Woburn**, a municipal corporation with executive offices at 10 Common Street, Woburn, MA by and through its Mayor (hereinafter the “City”), and _____ a Massachusetts corporation with a principal place of business at hereinafter the (“Contractor”) for the provision of services under the terms and conditions set forth herein.

Article I: Scope of Work

The Contractor shall furnish all labor, materials and equipment, and perform all work required in strict accordance with the Contract documents for the following project:

Article II: Contract Documents

In addition to this Agreement, the Contract documents consist of the following documents which are either attached to this Agreement or are incorporated herein by reference as if specifically set forth herein:

- Appendix A:
- Appendix B:
- Appendix C:

This Agreement, together with the other documents enumerated in this Article, constitute the entire Agreement between the City and the Contractor.

Article III: Priority of Documents

IN the event of inconsistency between the terms of this Agreement and the Project Manual, the terms of this Agreement shall prevail.

Article IV: Applicable Statutes

All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.

Article V: Term of Contract

This Contract shall be in effect upon execution and shall extend through _____ unless terminated earlier in accordance with Article IX herein.

Article VI: Compensation.

The total value of this Contract shall not exceed: \$_____. Services furnished by the Contractor in carrying out this Contract shall be paid in accordance with Appendix _____. In the event the term of this Agreement shall extend beyond the current fiscal year, the continuation of the Agreement shall be subject to appropriation or other availability of

sufficient funds to support continued performance. In the absence of such funding, the City shall cancel this Agreement, with no further liability of any kind to the Contractor.

The City of Woburn is tax exempt. No taxes shall be added to any invoice.

Article VII: Authorization of and Payment for Work Performed

The execution of this Contract does not constitute a notice to proceed or authorization to perform work. No work shall be commenced unless authorized by a written Work Order/Notice to Proceed prepared by the City's _____ specifying the work to be performed. The Contractor will be paid following completion and acceptance of the work authorized in accordance with the Contract. The City will use best efforts to pay within thirty (30) days of receipt of an invoice for the work authorized or acceptance of the work whichever date is later.

Article VIII: Contractor Covenants

The Contractor covenants and agrees to faithfully perform all of its obligations under this Contract and its proposal which is incorporated herein. Said performance shall be in a professional and workmanlike manner and in accordance with the standard of care and conduct that is generally acceptable in the business or profession. Contractor further certifies the suitability, professionalism and capability of all individuals employed to furnish any services specified in Article I above.

Article IX: Responsibility for the Work/Indemnification

The Contractor shall take all responsibility for the work, and shall take all precautions for preventing injuries to persons and property in or about the work and shall defend, indemnify and hold the City harmless from all loss, cost, damage or expense arising from injuries to persons or property in or about the work. The Contractor shall be responsible for any damage which may be caused by the failure or insufficiency of any temporary works. The Contractor shall effectively protect the work and shall be liable for all damage and loss by delay or otherwise caused by its neglect or failure to do so.

Article X: Warranty

Except as may be otherwise provided in the Project Manual, the Contractor shall replace, repair or make good, without cost to the City, any defects or faults arising within one (1) year after date of acceptance of work and materials furnished hereunder (acceptance not to be unreasonably delayed) resulting from imperfect or defective work done or materials furnished by the Contractor.

Article XI: Independent Contractor

The Contractor undertakes performance of this Contract as an independent contractor and shall be wholly responsible for the methods of performance.

Article XII: Assignment/Sub-Contracting

The Contractor agrees that it will not sell, assign or transfer this Contract or any part thereof or interest therein without the prior written consent of the City.

Article XII: Insurance.

The Contractor shall purchase and maintain such insurance as will protect it from claims which arise out of or result from the Contractor's operations under the Contract, whether such operations are by it or by any subcontractor or anyone directly or indirectly employed by any of them. The insurance required shall be with a company authorized to do business in the Commonwealth of Massachusetts and shall include insurance in the following amounts:

PROFESSIONAL LIABILITY -	\$1,000,000 MINIMUM
UMBRELLA -	\$1,000,000 MINIMUM
WORKER'S COMPENSATION -	per statutory requirements

Copies of all insurance certificates shall be provided to the City and are attached hereto as Appendix .

Article XIII: Termination

If the work to be done under this Contract shall be abandoned, or if the City determines that the Contractor has violated any provisions of this Contract, the City may terminate this Contract and/or notify the Contractor to discontinue such work or such part thereof as the City may designate. In the case of any default on the part of the Contractor with respect to any of the terms of this Contract, the City shall give written notice thereof, and if said default is not cured within fifteen (15) days after the issuance of written notice, the City shall notify the Contractor in writing that there has been a breach of the Contract, and thereafter the City shall have the right to secure the completion of the work remaining to be done on such terms and in such manner as the City shall determine, and the Contractor shall pay the City any money that the City shall pay another Contractor for the completion of the work, in excess of what the City would have paid the Contractor for the completion of the work, and the Contractor shall reimburse the City for all expenses incurred by reason of said breach. In case of such breach, the Contractor shall be entitled to receive payment only for work satisfactorily completed prior to said breach, less any retainage the City is entitled to. The amount of any balance due the Contractor shall be determined by the City and certified to the Contractor.

Article XIV: Governing Law Amendment

This Contract and performance thereunder are governed by the laws of the Commonwealth of Massachusetts and applicable provisions of the Woburn Municipal Code.

Article XV: Amendment

This Contract may only be amended by a writing signed by both parties.

Article XVI: Severability

The provisions of this Contract are severable. If any section, paragraph, clause or provision of this Contract shall be finally adjudicated by a court of competent jurisdiction to be invalid, than the remainder of this Contract shall not be affected thereby, and shall remain in full force and effect.

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

CITY OF WOBURN, MA

(CONTRACTOR)

Scott D. Galvin, Mayor

By: _____

I certify that an appropriation is available
in the amount of this Contract:

Title: _____

Charles E. Doherty, City Auditor

Account #

Michael D. Gauthier, Purchasing Agent

As to legal form:

Ellen Callahan Doucette, City Solicitor