

Our 20 Minute Agenda

1. Who: BH+A Cliff Notes

2. What: Design Considerations

Understanding your program and intentions

3. Where: Site Analysis

Locational analysis & Test Fits

4. When: Implementation

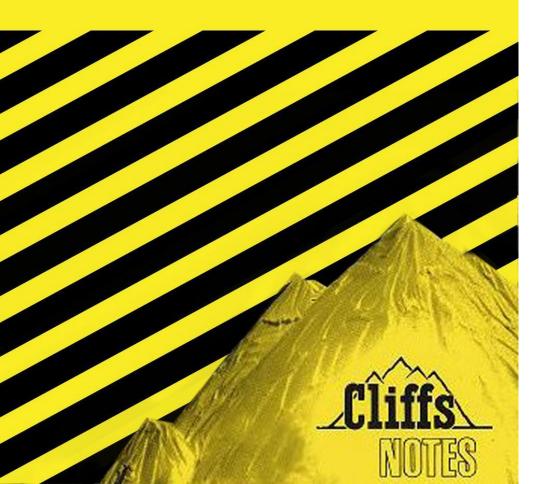
How do you control the cost and how long will it take

5. Why: Active Living "Aging in Place"

Common good serving individual needs



Bargmann Hendrie + Archetype (BH+A)





Boston Based
30 Years
40 Staff
18 Registered
WBE

120 Massachusetts Chapter 149 & CM-at-Risk Public Projects



Over 30 Community Centers (many incorporating seniors)

Allied Veterans Memorial Ice Rink

Andover Community Youth Center

Beth Pancoe Community Pool

Bluemont Community Center

Chatham Community Center

Concord City-wide Community Center

Danny's Place Youth Center

Falmouth Aquatic Center & Ice Rink

Gertrude Ederle Community Rec Center

Greater Burlington Rec/YMCA, joint facility

Hollis Street Community Center

Hyannis Youth & Community Center

Joseph N. Hermann Youth Center

Kennebunk Community Center

Kittery Community Center

Lucketts Community Center

Malta Community Center

Maple Street Community Pool

Marshfield Boys & Girls Club

Marshfield Community & Senior Center

Mashpee Community & Senior Center Study

Milford Youth Center

Old East Suffolk Community Center

Orangetown Community Center

Passamaquoddy Tribe Community Center

PFD Curley Community Center

PFD Hyde Park Community Center

PFD Shelburne Community Center

Sharon Community & Senior Center

Smith Aquatic & Community Center

Squamscott Community & Senior Center

Squamscott Community Commons

Standish Community Center

The Swimming Hole Community Pool

Vine Street Community Center

Winchester Teen Center

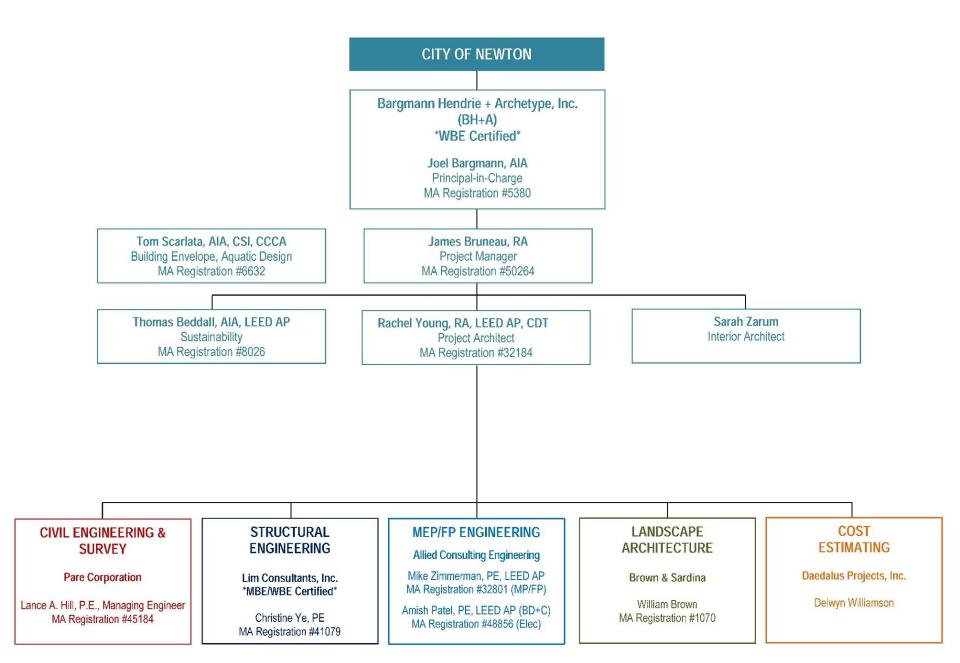
Wiscasset Community & Senior Center

Wiscasset Community Center

Worcester Boys & Girls Club



Organization Chart





Full Range of Services for NewCAL

Basic Services

Architecture

Interior Design

Environmental Consulting

Structural Engineering

Landscape Architecture

Fire Protection Engineering

Plumbing Engineering

HVAC Engineering

Electrical Engineering

Lighting Design

Energy Modelling

Data Communications Consultant

Sustainable Design Consultant

Cost Estimating

Accessibility Consultant

Code Consulting

Security Consultant

Acoustical Consultant

Audio Visual Consultant

Food Service (Kitchen) Consultant

As Necessary Services

Geotechnical Engineering

Site Survey

Archeological Survey

Geo-Environmental

Hazardous Materials

Traffic Engineering

Furniture, Fixtures & Equipment

Project Management Website

LEED or other Certification Fees

Commissioning Agent

Building Operational Cost Analysis

Staffing Operational Analysis

Revenue and Expense Analysis

"5 Pillars" of Design







Volunteering

Assistance with food, nutrition, recreation, culture, transportation & social service becomes a "feeder system" for CAL







Lifelong Learning & the Arts

Focus on intellectual stimulation, learning, personal growth and enhanced quality of life





Wellness Center

Focus on healthy aging/active living for different senior age groups



Information Dissemination

Information and service delivery to help Newton residents remain independent;

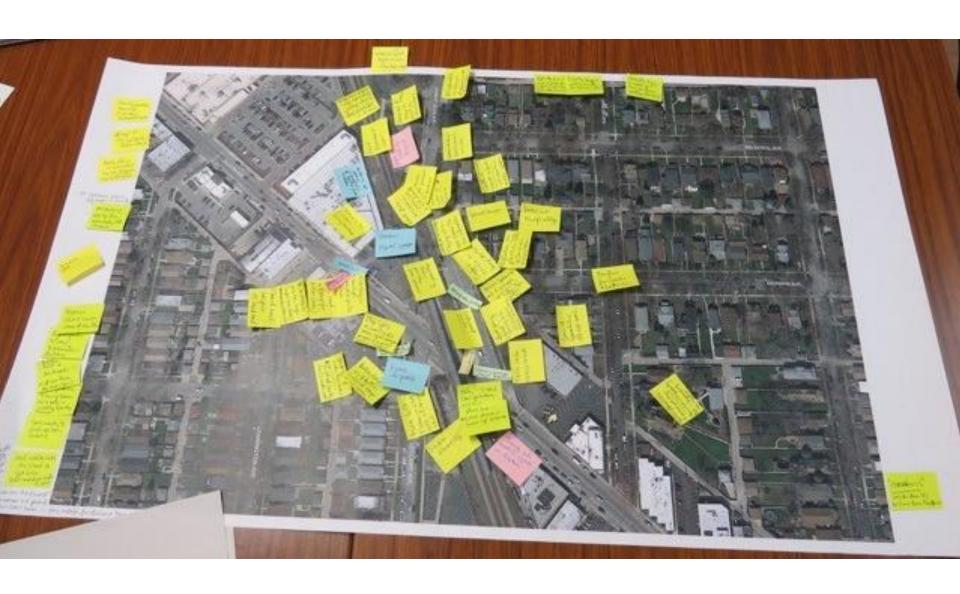


Socialization

Café & Lobby opportunities for social interaction

How we would work with Newton

Understanding your program intent and avoiding preconceptions, considerations, site impacts



Sharing Multi-Use Gyms





Program Understanding: Gym & Track Areas









Program Understanding: Kitchen Size and Use



Program Refinement: Kitchen









Program Understanding: Intergenerational Kitchens & MPR's



secure senior pantry

program rooms double as ante room use staff access

Program Refinement: Multipurpose Room









The Evolving Multi-Purpose Room





Multi-Purpose / Multi-Use

A general multi-purpose room used for children's play space, dance, aerobics, lunches, family rentals and even winter farmer's markets becomes a theater at night



Multi-Purpose / Multi-use





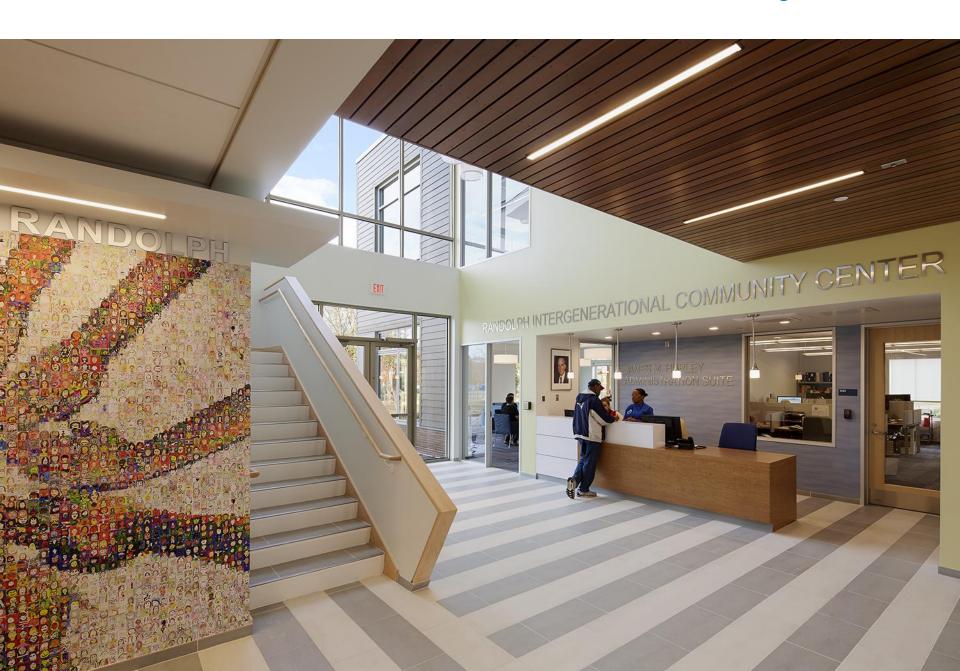
Lobby – Intergenerational Considerations



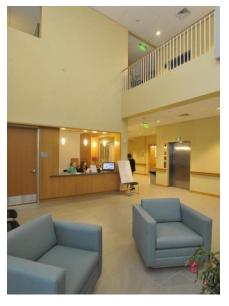




Creating a Balance



Age-Friendly Details









Areas for rest, subtle hand rail designs, wainscot, wide circulation space, convenient stairs

Flexibility & Transparency





Understand "What is Being Requested"



PLEASE NOTE:

Sign-up for November/Decembe programs and classes will begin Thursday, October 26. We canno

Monday's Lunch Bunch Page 7 SHINE Bulletin

REP DENISE GARLICK'S OFFICE HOURS MONDAY, DECEMBER 4TH 11:00 A.M. - 12:30 P.M.

RICHARD ROSS OFFICE HOURS 10:00 - 11:00 A.M. MONDAY, FEB. 5TH 10:00 - 11:00 A.M.

HOLIDAY CLOSINGS MONDAY, OCTOBER 9 COLUMBUS DAY

THURSDAY, NOVEMBER 23 THANKSGIVING

THE NOTABLES WEDNESDAY, NOVEMBER 15 · 2:00 - 3:00 P.M.

NEEDHAM ELEMENTARY HONORS CHORUS WEDNESDAY, NOVEMBER 8TH • 3:00 P.M. The Needham Elementary Honors Chorus is an ensemble of auditioned 4th & 5th graders from all five of Needham's elementary schools.

VETERANS DAY CONCERT

The Notables are a women's acappella group made up of singers from suburban communities south and west of Boston.

Thanks to the generous support of Retired Men's Club of Needham, there is no charge for this program.

THE NEWTON SWING BAND WEDNESDAY, DECEMBER 6TH - 1:30 - 3:00 P.M.

nber "Sunny Side of the Street," "If I Were a Rich Man," "Jersey Bounce," "Side

ARONS FAMILY HOLIDAY SPECTACULAR THURSDAY, DECEMBER 14 : 2:00 - 3:00 P.M.

The Arons a mother-daughter duo will perform classic holiday favorites. Join us as theses new entertainers perform toe tapping tunes at the CATH. Thanks to the generous support from ComForCare, there is not charge for this program

NEEDHAM RETIRED MEN'S GLEE CLUB FRIDAY, DECEMBER 15 • 2:00 - 3:00 P.M.

The Glee Club will perform Broadway hits, folk songs, spirituals, sing-a-longs and morel Thanks to the generous support of Retired Men's Club of Needham.

WEDNESDAY, DECEMBER 20TH · 4:30 - 5:30PM

Join us for an afternoon of music, games, singing, and enjoying each others company Judy Kaplan, a local talent on the harp, will be performing as we have treats, cocoa

Thanks to the generous support of Wingate, there is no charge for this program EATON FUNERAL HOME ~ A TRADITION OF CARING

Family Owned & Operated - Serving

1351 HIGHLAND AVE. · NEEDHAM 781-444-0201

MONDAYS 1:00 - 3:00 P.M. NOVEMBER 6, 13, 20, 27

DECEMBER 4, 11, 18 Contact Person: Paul 617-759-1568 KEEP WELL CLINIC WEDNESDAY.

DECEMBER 6, 20

DIRECTOR'S LETTER A BIG - BIG THANK YOU TO THE KNITTING GROUP

After reading the letter from the Boston Medical Center, I cannot tell you now found I was by your kindness shown to the blanket project and patients. I appreciate the hard work of the kritters who volunteered, Know that your contributions will make a difference to enhance patient care. It reminds me that the goodwill and declared of volunteering is truly (or can truly be) with us at any moment! ... Thank you ladies

for your love, support, and kindness.

DEAR FRIENDS:

Since the year is swiftly passing by, if you planned to fill out the membership form and send in your dues, we will apply it to the 2018 year (for January 1, 2018 to December 31, 2018), Giving you 2 extra months. So please join now! We have a lot of new embers who are receiving the Compass and enjoying the programs at The Cente The Friends pay for printing and mailing of the Compass and support other services programs. Your membership helps defray expenses.

Thank you for your wonderful support. We wish you all a very happy holiday season

FRIENDS OF THE CENTER AT THE HEIGHTS DONATIONS

Donations: John C. Helfrey + James W. & Gwendolyn Brown In Memoriam: Kathleen Powers in Memory of Joseph Powers Agnes E. O'Brien in Memory of Jo-Anne Donald

TRIP NEWS

PLEASE JOIN THE ERIENDS FOR OUR UPCOMING TRIPS PLEASE BOOK EARLY TO AVOID DISAPPOINTMENT

For reservations, please phone 781-455-7555 Ext 209. Full payment is due with reservations. Make checks payable to Friends or Friends of The Center at the Heights and mail to 300 Hillside Ave., Needham, MA 02492, Attr: Trips

Trips requires at least 36 passengers to operate (No refunds if cancellations) TUESDAY NOVEMBER 14 Foxwoods Resort & Casino COST \$29.00

Trip departs 7:45 am from Linden and Chambers parking lot and 8:00 am from The Center at the Heights. Return approx. 6:30 pm WEDNESDAY, DECEMBER 6 Sleigh Bells Swing Christmas Show and Lunch at Davensport Yacht Club with Krianthi Pappas

COST \$79.00 Please give lunch choice of chicken with stuffing or scrod with seasoned crackers when booking, along with your pick-up location

Trip departs 10:15 A.M. from Linden and Chambers parking lot and 10:30 A.M. from The Center at the Heights Return approximately 4:00 P.M.

CALL SHINE FOR HELP COMPARING OPTIONS

year to make sure you have the plan that works best for you for next year Call your Senior Center and ask for a SHINE appointment. Resure to bring your

Trained SHINE volunteers offer free, confidential coursel on all aspects of health insurance to anyone on Medicare. Medicare related matters (other than an appointment), 1-800-AGE-INFO (1-800-243-4636), then press or say 3. Or you get the SHINE answering machine, leave your name a number. A volunteer will call you back, as soon as possible.

APOLLO 13 (1995)

LOOKING FOR

LEGAL ADVICE?

Sign up for a free 20 minute

TUESDAY, NOVEMBER 14

10:00 A.M. - 12:00 P.M.

INCLEMENT WEATHER POLICY

It is the policy of the CATH to follow

ROOM OPEN HOURS

10AM - 12PM / 1 - 3PM

DECEMBER:

MONDAYS: 11, 18

TUESDAYS: 5, 12, 19, 26



Please call 781-455-7555 to RSVP, or email

BEREAVEMENT

ART OF RITUALS"

THURSDAY, NOVEMBER 2 2:00 - 4:00 P.M.







SSB



FRIDAY, DECEMBER 15 10:00 - 11:30 A.M. (15 Minute Sessions)

Must Pre-register Limit of 5 Participants per Session

PLEASE NOTE THAT WE WILL BE ADDING "POP-UP" PROGRAMS

f we have space in the CATH after

December 4, 11, 18 Cost is \$28



and hope he is

playing his music

for his friends and his family and we

look forward to him

returning soon.

200



7 WEEK SESSION 2:00 - 3:00 P.M. NOVEMBER 7, 14, 21, 28 WALTZ DECEMBER 5, 12, 19 CHA-CHA

MEDITATION MORNINGS

COMPASS COLLATING: JANUARY / FEBRUARY DECEMBER 20 9:30 AM

SHOPPING EXPERIENCE

EDIDAY NOVEMBED 17

MARKET BASKET.

FRIDAY, DECEMBER 15

MARKET BASKET. WALTHAM

Departure from the Seni

If you require a pick up at your home

Center will be 10:00 A.M. Call

THE ELDER **ABUSE HOTLINE**

o report or ask questions about 10:30 A.M Center at The Heights. **GROCERY SHOPPING**

To participate in our regular ORT FOOD



FRIDAY, DECEMBER 15 FRIDAY, DECEMBER 22

own memory, the troubled gins her own investigation, while police suspect that Rachel may have crossed a dangerous line.

DAY, DECEMBER 8

ard of the strangers' home. s the authorities what she

1:00 P.M.

NEW!! COMPUTER DAY, DECEMBER 1

De Niro) and it's all downhill from there

Penny Grossman Ed Cosgrove Gary Crossen Carol deLemos Phyllis Fanger Dan Goldberg Monica Graham

AGING BOARD

MEMBERS

Colleen Schaller

:00 P.M. 00 P.M.

ng by the Front Desk

NG CLASS E NURSING CENTER

IDURADAL PEVENIDER / 14.30 - 3.30 P.M.

class she will be giving other tips on healthy cooking. MONDAY'S LUNCH BUNCH

SOCIALIZE AND ENJOY A GOOD MEAL! NOTE NEW TIME!! Depart from the Center at 11:15 A.M. in our van.

Monday, November 06: Grassfield's, Waltham

· Monday, November 13: Chinatown, Stoughton Monday, November 20: Corrib Pub & Restaurant, West Roxbury

Monday, November 20: Corrib Pub & Restaurant, W. Monday, November 27: Horse N° Carriage, Notfolk
 Monday, December 04: Bertuccits, Norwood
 Monday, December 16: Hornelly's, Framingham
 Monday, December 18: Ninety-Nine, Waltham
 Monday, December 18: Ninety-Nine, Waltham
 Monday, December 25: CATH CLOSED
 Monday, Lanuary 01: CATH CLOSED

" A A

BALLROOM DANCING

DECEMBER 5, 12, 19

DECEMBER 7, 10, 30

7 WEEK SESSION 9:15 - 10:15 A.M NOVEMBER 3, 17, 24 DECEMBER 1, 8, 15, 29 nstructor: Pearl Pre Cost is \$28

Due to the nature of programing and events, all dates. times, and programs are subject to change. We thank you for your patience.

MAXIMUM OF 8 · COST IS \$15.00 PER CLASS

Marjorie and Carol will work with you individually to help you master photos, emails, Web Sites, the Internet, pop-up messages, your smartphone camera, or your Kindle. They answer your questions skillfully and with patience. You ask the questions, they work out the answers. Birng your device!

NEW PROGRAM! BRAIN GAMES MONDAY, NOVEMBER 6, 13, 20, 27 DECEMBER 4, 11, 18

Pearl Pressma COST IS \$28

the aging process. This fun and unique class is a combination of specific activities ned to improve your memory, reasoning, conceptualization, language and em-solving skills. Why not take a break from doing the Sunday crossword e or Lumosity and come exercise your mind while making new friends?

Discover how much fun brain training can be!

Design for Staff Changes

MEMBERS

ASSES

FEK SESSION

he joy of yogal Pleas

ITIS EXERCISE

net is \$24

LaTanya Steele, BSW, MPA YOGA

Jessica Moss, LICSW

Aicha Kelley

Danielle Arenda

Clif Holbrook

Yustii Mejia

Kerrie Cusack, LCSW 0 - 2:00 P.M.
Social Worker ABER 2, 9, 16, 30
CEMBER 7, 14

STH TRAINING

See description under Monday Strength Training for Balance and

HOLIDAY HARMONIES HISTORY LECTURE

DROP-IN

GAMES AND

CRAFTS

MONDAYS

GAMES

1:00 - 3:00 P.M.

BRIDGE 9:30 A.M. - 12:30 P.M.

TUESDAYS

BRIDGE 9:00 A.M. - 12:00 P.M.

WEDNESDAYS

CANASTA (CLASSIC)

THURSDAYS

BRIDGE 9:00 A.M. - 12:00 P.M.

KNITTING

12:00 P.M. DUPLICATE BRIDGE

MAH JONG

(LESS EXPERIENCED) 12:30 - 2:30 P.M.

FRIDAYS

10:15 - 11:30 A.M.

MAH JONG 1:00 - 3:00 P.M.

SCRABBLE

1:00 - 3:00 P.M.

DOMINOES 1:00 - 3:00 P.M.

BRIDGE

12:00 NOON - 2:30 P.M. th photos that show

ESSING

autiful silk scarf YOU

ng a friend!

THURSDAY, DECEMBER 14 · 2:30 - 3:30 P.M. Frank King for a musical lecture where you'll get to hear the stan

of this Golden Era - including rare, seldom-heard recordings - and also learn some fascinating secrets about the singers and the songs. In his next special lecture entitled "Holiday Harmony Histories," Mr. King will discuss

- the fascinating origins of 8 beloved Christmas and Hanukkah songs, including:
- The ongoing battle over the birthplace of "Jingle Bells"
- The smash hit Christmas song about a hippopotamus
 The song some believe was really code for an "Underground Catechism"
 The Christmas song that mentions palm trees and Beverly Hills

 The Christmas song that mentions palm trees and Beverly Hills

. The holiday song about a gambling toy Thanks to the generous support from Home Instead, there is no charge for this program, (NO PROGRAM ON NOVEMBER 22) 12:00 - 3:00 P.M.

ART MATTERS 10:30 AM

CREATIVE WRITING 10:00 A.M.

CURRENT EVENTS 10:30 A.M. NOVEMBER 7, 21 DECEMBER 5, 19

This group is a friendly place to equally share information with one another in a supportive

CENTER BOOK SECOND FRIDAY OF

> **NOVEMBER 17** (DAY CHANGE DUE TO HOLIDAY) 10:30 A.M. Amor Towles'

Jane Austen's Persuns

Scheduling – How to Ensure Multi-Use is Possible?



Dedicated Spaces with overlapping usage



Different Approaches to Fitness Programming



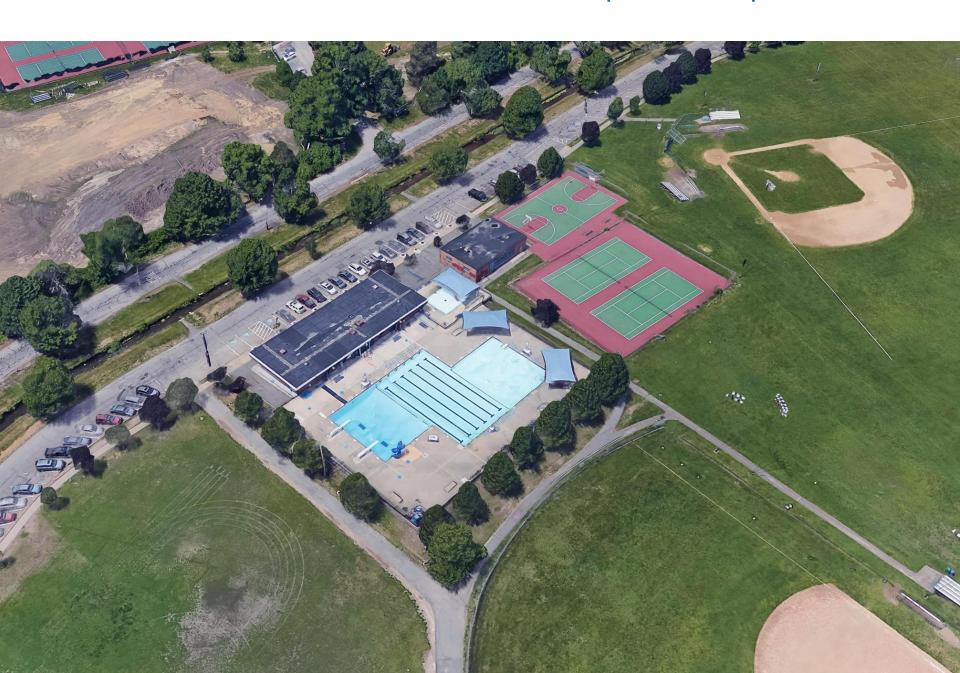




Dedicated Maker Space (in lieu of computer labs)



Related BH+A Expertise for potential sites



Inside Outside Opportunities at Recreation Sites





Outdoor Spaces

- Shade
- Infrastructure and Technology
- FF&E
- Security and Safety
- Deck Design
- Green Roof Opportunity

Community Context









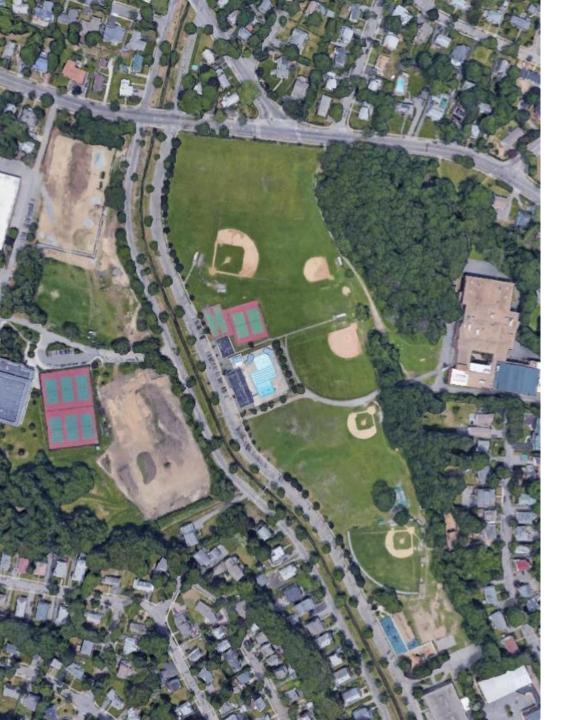


Community Context



Community Context





Site Analysis

Site Considerations

Relative Location Acquisition or Use Cost **Development Cost Restrictive Conditions Utilities** Constructability **Building Adaptability** Site Configuration **Environmental Impact** Traffic Parking **Public Transportation** Accessibility **Exterior Site Amenities Community Vision**

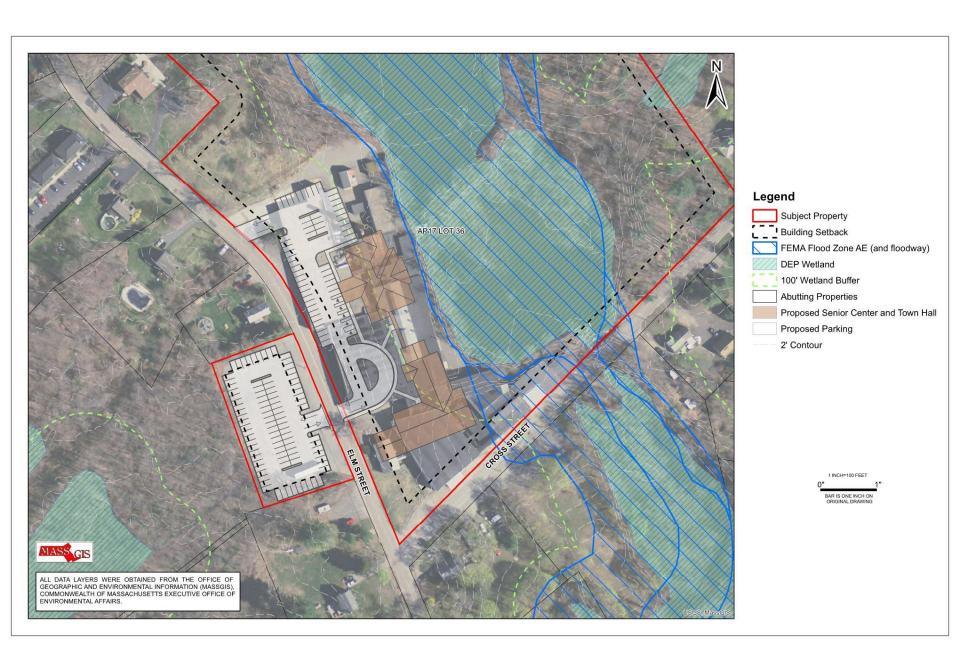


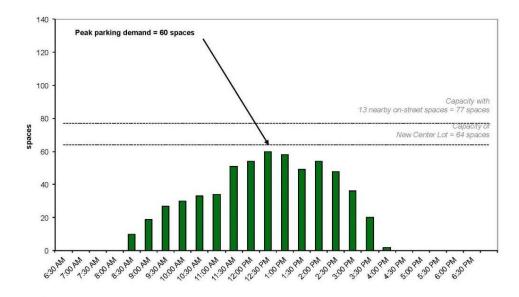
Table 7. Program Duration and Participation at New Center, Scenario 1 - Typical Weekday

| Program Times | Program | | | | | |
|------------------------|--|--|--|--|--|--|
| 8:30 a.m 4:00 p.m. | Social services, SHINE, and Additional services | | | | | |
| 8:30 a.m. – 10:30 a.m. | Breakfast | | | | | |
| 9:00 a.m. – 4:00 p.m. | Pool | | | | | |
| 9:00 a.m. – 12:00 a.m. | Bridge/Canasta | | | | | |
| 9:30 a.m. –10:30 a.m. | Yoga | | | | | |
| 9:30 a.m 10:30 a.m. | Wii | | | | | |
| 10:00 a.m 11:00 a.m. | French | | | | | |
| 10:00 a.m 11:00 a.m. | Biology | | | | | |
| 11:00 a.m 12:00 p.m. | Aerobics | | | | | |
| 11:00 a.m 1:00 p.m. | Current Politics | | | | | |
| 11:45 a.m 1:00 p.m. | Lunch | | | | | |
| 12:15 p.m1:15 p.m. | Strength Training | | | | | |
| 1:00 p.m. – 4:00 p.m. | Canasta/Cribbage | | | | | |
| 1:00 p.m. – 2:00 p.m. | Religion | | | | | |
| 1:30 p.m. – 2:30 p.m. | Better Balance | | | | | |
| 1:30 p.m. – 3:30 p.m. | Movie | | | | | |
| 2:00 p.m. – 4:00 p.m. | Support Group | | | | | |
| 2:00 p.m. – 3:00 p.m. | Arthritis Exercise | | | | | |
| 3:00 p.m. – 4:00 p.m. | Meditation | | | | | |
| | | | | | | |

Note that the 300 program participants reflect 200 daily visitors. Based on a that 40% of participants stay for 1 activity, 40% stay for 2 activities, and 20% employees.

Total

Figure 10. Visitor Parking Demand by Time of Day: Scenario 1, Typical Weekday



Participants

30



Site Studies: Alternatives on one site









Community Participation



What matters to Newton teens, families & seniors?



Different "scales" of Community Outreach













Sustainability: Building Systems



- VRF HVAC system
- Geothermal
- Lighting
- Wall Insulation
- Roof Insulation
- Storm Water Management
- Integrated Design

Energy Model

Baseline versus Proposed Building and the variables analyzed for ROI



The Green Engineer, LLP

Sustainable Design Consulting

Detailed Comparison of Proposed Design versus Baseline Design:

| Design Parameter | Proposed Building | Baseline Building |
|---------------------------|--|---|
| Exterior Wall | Above Grade Walls: | Above Grade Walls: |
| | Renovation: U-value = 0.038 | Existing: U-value = 0.064 |
| Roof Construction | Roof U-value = 0.017 | Roof U-value = .048 |
| Fenestration Type | All vertical windows are: Low-e double glazed windows SHGC = 0.29 | Double Pane clear glass. SHGC = 0.39 |
| Fenestration U- factor | U-value =0.34 | U-value = 0.45 |
| Fenestration VLT | 0.7 | 0.7 |
| Interior Lighting | 0.70 W/sf according to the lighting design schedule | 1.0 W/sf (Area Method) |
| HVAC System Types | Primary: Mitsubishi VRV heat recovery type heat pumps. | PSZ-AC according to Appendix G TABLE G3.1.1A |
| | Heating COP=3.512 Cooling COP = 3.458 | Unitary Cooling equipment efficiency: From Table 6.8.1A, minimum efficiency requirement is 10.1 EER Furnace Heating efficiency of 80% |
| | ERV : Energy Recovery Ventilator with 76% efficiency. | n/a |
| | Gas Absorption Unit to generate hot water for ERV and kitchen MAU, with a G.U.E of 150% | n/a |

- Equipment efficiencies based on mechanical schedules
- · Building occupancy schedule as provided by the project architect.

Occupancy hours: Monday to Friday: 8:30am – 4pm

Some weeknight occupancy No occupancy on weekends



Baseline – The Baseline is modeled with ASHRAE 90.1-2007 compliant building envelope, lighting and HVAC systems.

ECM#1 - The baseline building with "as-designed" insulation on the walls.

ECM#2 - The baseline building with "as-designed" insulation on the roofs.

ECM#3 - The baseline building with "as-designed" window assembly.

ECM#4 – The baseline building with "as-designed" building envelope (combination of ECMs 1 to 3).

ECM#5 - The baseline building with as 30% reduced lighting power density.

ECM#6 – The baseline building with "as-designed" building envelope and reduced lighting power density (combination of ECM 5 and 6).

ECM#7- As designed building with VRV Heat pumps, energy recovery, improved envelope and lighting, gas fired absorption heat pump. This is the proposed building.

Basic assumptions:

The geometry of the building is based on the latest AutoCAD floor plans, except that window positions are slightly simplified based on a percentage glazing in each zone and exposure. We do not believe this simplification has a material impact on the results described below.

For the various models the following basic parameters were used:

| Total Area (SF) | 23200 |
|-------------------|-------|
| Basement (SF) | 3330 |
| First Floor (SF) | 11266 |
| Second Floor (SF) | 8604 |

The table below summarizes the energy use and cost results of the eQuest modeling for various ECMs in the design.

Results

| Energy Comparison (Mbtu/yr) | | | | | | | | | | |
|---|------------------|-----------------------|--------------------|-----------|--------------------|--------------|-------|---------------|----------|-------|
| | Lights | Misc | Heating | Cooling | Pumps & Aux | Vent Fans | DHW | Ext. Lighting | TOTAL | |
| Baseline (ASHRAE 90.1-2007) | 228.40 | 221.00 | 280.00 | 53.00 | 16.00 | 203.00 | 28.00 | 6.00 | 1,035.40 | |
| ECM-1 - Improved Wall (Design) | 228.40 | 221.00 | 256.00 | 53.00 | 15.40 | 197.00 | 28.00 | 6.00 | 1,004.80 | 3.0% |
| ECM-2 - Improved Roof (Design) | 228.40 | 221.00 | 270.00 | 53.00 | 16.00 | 199.00 | 28.00 | 6.00 | 1,021.40 | 1.4% |
| ECM-3 - Windows (Design) | 228.40 | 221.00 | 235.00 | 55.00 | 15.60 | 192.00 | 28.00 | 6.00 | 981.00 | 5.3% |
| ECM-4 - ECMs 1,2 and 3 combined | 228.40 | 221.00 | 189.00 | 56.00 | 15.30 | 180.00 | 28.00 | 6.00 | 923.70 | 10.8% |
| ECM-5 - Reduced LPD (30%) | 160.00 | 221.00 | 318.00 | 48.00 | 15.50 | 200.00 | 28.00 | 6.00 | 996.50 | 3.8% |
| ECM-6 - ECMs 4 and 5 combined | 160.00 | 221.00 | 222.00 | 50.00 | 15.30 | 177.00 | 28.00 | 6.00 | 879.30 | 15.1% |
| ECM-7 - As Designed Building | 160.00 | 221.00 | 48.60 | 53.00 | 6.00 | 109.00 | 14.00 | 6.00 | 617.60 | 40.4% |
| % End-use for Baseline | 22% | 21% | 27% | 5% | 2% | 20% | 3% | 1% | i i | |
| Energy Cost Comparison (Mbtu/yr) | | | | | | | | | | |
| | Energy (MBtu/SF) | Electricity Cost (\$) | | Cost (\$) | Savings (\$) | % Savings | | | | |
| Baseline (ASHRAE 90.1-2007) | 1035 | 44727 | | | | - | | | | |
| ECM-1 - Improved Wall (Design) | 1006 | 44355 | | \$47,892 | | 1.6% | | | | |
| ECM-2 - Improved Roof (Design) | 1022 | 44492 | \$3,707 | \$48,199 | \$454 | 0.9% | | | | |
| | | | | | | | | | | |
| ECM-3 - Windows (Design) | 981 | 44156 | \$3,273 | \$47,429 | \$1,224 | 2.5% | | | | |
| | 981 923 | 44156 43439 | | - | | 2.5% 5.2% | | | | |
| ECM-3 - Windows (Design) | | | \$2,693 | \$46,132 | \$2,521 | | | | | |
| ECM-3 - Windows (Design) ECM-4 - ECMs 1,2 and 3 combined | 923 | 43439 | \$2,693 \$4,303 | \$46,132 | \$2,521 \$4,351 | 5.2% 8.9% | | | | |

The modeling indicates that the proposed building will reduce energy consumption by about 40% and energy costs by about 33% as compared to the baseline building.

We understand that an initial goal of a 50% energy savings had been established by the design team. Currently, the majority of savings for the project comes from savings in heating, lighting and fans. We're fairly close to maxing out available savings in the HVAC system – typically VRF systems show about 30% savings, compared to conventional systems. If additional savings is desired, ECMs to be considered should target areas where further reduction is most achievable. These might include:

- · Further reduction in lighting power density,
- Daylight dimming and other lighting control strategies
- Reduction in plug and process loads
- Demand control ventilation to reduce ventilation loads and related fan energy
- · Renewable energy production

Sustainability: LEED

Project: The Chain Forge

0 2 0 EAc7 Green power and carbon offsets (1-2)

Date: 4/26/18 Goal: Certified

LEED Checklist for New Construction and Major Renovation v4



| Yes | ? | No | | | | | | | | | |
|-----|----|----|------|---|---|-----------|---------|----------|------------|--|-----|
| 47 | 39 | 24 | 1 | Project Totals (pre-certification estimates) | | Certified | d 40-49 | Silver 5 | 0-59 point | s Gold 60-79 points Platinum 80-110 points | |
| | | | | | | Yes | ? | No | | | |
| 1 | 0 | 0 | | Integrative Process (IP) | | 9 | 4 | 0 | | Materials & Resources (MR) | |
| 1 | 0 | 0 | IPc1 | Integrative Process (1) | d | Y | | | MRp1 | Storage & Collection of Recyclables (P) | d |
| | | | | ,g | | Y | | | | C&D waste management planning (P) | С |
| 11 | 2 | 3 | | Location and Transportation(LT) | | 5 | 0 | 0 | | Building life-cycle impact reduction (2-5) | C |
| 0 | 0 | 0 | LTc1 | LEED-ND location (8-16) | d | 1 | 1 | 0 | | BPDO - environmental product declarations (1-2) | С |
| 1 | 0 | 0 | LTc2 | Sensitive land protection (1) | d | 1 | 1 | 0 | | BPDO - sourcing of raw materials (1-2) | C |
| 2 | 0 | 0 | LTc3 | High Priority Site (1-2) | d | 1 | 1 | 0 | MRc4 | BPDO - material ingredients (1-2) | C |
| 4 | 1 | 0 | LTc4 | Surrounding density and diverse uses (1-5) | d | 1 | 1 | 0 | MRc5 | C&D waste management (1-2) | C |
| 2 | 1 | 2 | LTc5 | Access to quality transit (1-5) | d | | | | | | |
| 1 | 0 | 0 | LTc6 | Bicycle facilities (1) | d | 4 | 7 | 5 | | Indoor Environmental Quality (IEQ) | |
| 1 | 0 | 0 | LTc7 | Reduced parking footprint (1) | d | Y | | | IEQp1 | Minimum IAQ Performance (P) | d |
| 0 | 0 | 1 | LTc8 | Green vehicles (1) | d | Y | | | | Environmental Tobacco Smoke (ETS) Control (P) | d |
| | | | | · · · · · · · · · · · · · · · · · · · | | 1 | 1 | 0 | IEQc1 | Enhanced indoor air quality strategies (1-2) | d |
| 1 | 8 | 1 | | Sustainable Sites (SS) | | 1 | 2 | 0 | | Low-Emitting Materials (1-3) | С |
| Y | | | SSp1 | Construction Activity Pollution Prevention (P) | С | 1 | 0 | 0 | IEQc3 | Construction IAQ Management Plan (1) | С |
| 1 | 0 | 0 | SSc1 | Site Assessment (1) | d | 0 | 2 | 0 | IEQc4 | Indoor Air Quality Assessment (1-2) | С |
| 0 | 2 | 0 | SSc2 | Site development - protect/restore habitat (1-2) | d | 1 | 0 | 0 | IEQc5 | Thermal comfort (1) | d |
| 0 | 0 | 1 | SSc3 | Open space (1) | d | o | 1 | 1 | IEQc6 | Interior lighting (1-2) | d |
| 0 | 3 | 0 | SSc4 | Rainwater management (2-3) | d | 0 | Ö | 3 | IEQc7 | Daylight (1-3) | d |
| 0 | 2 | 0 | | Heat island reduction (1-2) | d | 0 | 1 | 0 | | Quality views (1) | d |
| 0 | 1 | 0 | | Light pollution reduction (1) | d | 0 | 0 | 1 | IEQc9 | Acoustic performance (1) | d |
| | | | | | | | | | | (1) | |
| 3 | 4 | 4 | | Water Efficiency (WE) | | 3 | 3 | 0 | | Innovation & Design Process (ID) | |
| Y | - | | WEp1 | Outdoor water use reduction (P) | - | 0 | 1 | 0 | | Ex. Perf. LTc5, Access to Quality Transit | d/c |
| Y | | | | Indoor water use reduction, 20% (P) | d | 1 | 0 | 0 | | Green Building Education | d/c |
| Y | | | | | | 0 | 1 | 0 | | | d/c |
| 2 | 0 | 0 | | Building-level water metering (P) Outdoor water use reduction (1-2) | d | 1 | 0 | 0 | | Ex. Perf. MRc5, Recycling >95%? Boston Credit - Historic Preservation | d/c |
| 1 | 1 | 4 | | Indoor water use reduction (1-2) | d | 0 | 1 | 0 | | | d/c |
| - | | | | | - | | | | | Sustainable Purchasing - Lamps? | _ |
| 0 | 2 | 0 | | Cooling tower water use (1-2) | d | 1 | 0 | 0 | IDc2 | LEED [®] Accredited Professional (1) | d/c |
| 0 | 1 | 0 | WEc3 | Water metering (1) | d | | _ | • | | Desired District (DD) | |
| | | | | | | 3 | 1 | 0 | | Regional Priority (RP) | |
| 12 | 10 | 11 | | Energy & Atmosphere (EA) | | 1 | 0 | 0 | | LTc5 Access to quality transit | d |
| Y | | | | Fundamental commissioning and verification (P) | C | 0 | 1 | 0 | RPc1.2 | SSc5, Rainwater Management (2 pts) | d |
| Y | | | | Minimum Energy Performance (P) | d | 1 | 0 | 0 | | LTc3, High Priority Site | d |
| Y | | | | Building-level energy metering (P) | d | 0 | | 0 | RPc1.4 | WEc2 (40%), EAc5 (2 pts) | d |
| Y | | | | Fundamental Refrigerant Management (P) | d | 1 | 0 | 0 | Alt. | MRc1 Building Life Cycle Impact Reduction | d |
| 0 | 6 | 0 | | Enhanced commissioning (2-6) | С | 0 | * | | Alt. | CONT. CONT. CO. CO. CO. CO. CO. CO. CO. CO. CO. CO | d |
| 12 | 0 | 6 | EAc2 | Optimize energy performance (1-18) | d | | | | | | |
| 0 | 1 | 0 | | Advanced energy metering (1) | d | Yes | ? | | | Potential Scores | |
| 0 | 0 | 2 | | Demand response (1-2) | d | 47 | 39 | | | | _ |
| 0 | 0 | 3 | | Renewable energy production (1-3) | d | I | 86 | Maxi | mum Po | ssible Score | ┙ |
| 0 | 1 | 0 | EAc6 | Enhanced Refrigerant Management (1) | d | | | | | | |

Site Cost Drivers

With a common building, which factors at a site may contribute to different total costs



Demolition Topography Soil Type Water Table Wetlands Storm Water / Drainage **Utilities Access** One Story, Two Story **Hazardous Materials Driveways and Access** Collateral improvements **Planning Board Conservation Commission**

Simulating the Bid Process



TOTAL

| OTAL | COST/SF |
|-----------|---------------|
| | 23,370 GSF |
| N | leedham, MA |
| veednam s | Senior Center |

| Owner: | TOWN OF NEEDHAM |
|--------|-----------------|
| | |

Project: NEEDHAM SENIOR CENTER

Estimator: MfM S/F: 23,066

Date: 16-Jun-11

Location: Needham, Ma.

Pricing: DESIGN DEVELOPMENT ESTIMATE Revision 1

Description

Schedule: 14 months

Division Total

Reconciliation

utility back charge (electrical)

TOTAL

| | | | Description | Division 1 out | COST DI |
|---|-----------------------|------------------------|--|------------------------|--------------------|
| | | | S | \$514,372 | \$22.30 |
| | | | ape | \$122,830 | \$5.33 |
| ESIGN DEVELOPMENT COST ESTIMATE COMPARISON | | | | \$0 | \$0.00 |
| | | | | \$455,335 | \$ 19.74 |
| Division | Keough Total | Daedalus Total | | \$111,388 | \$4.83 |
| 1 - General Requirements | \$132,600 | distributed below | | \$537,752 | \$23.31 |
| 2 - Sitework & Utilities | \$837,202 | \$941.703 | als ,stairs, rails | \$121,450 | \$5.27 |
| 3 - Concrete | \$455,335 | \$432,756 | | \$492,880 | \$21.37 |
| I - Masonry | \$111,388 | \$140,869 | re Protection | \$302,831 | \$13.13 |
| 5 - Metal | \$659,202 | \$518,678 | | \$48,220 | \$2.09 |
| i - Woods and Plastics | \$492.880 | \$482.117 | | \$105,725 | \$4.58 |
| - Thermal & Moisture Protection | \$302,831 | \$367,432 | <u>d</u> | \$490,772 | \$21.28 |
| - Memar & Moisture Protection - Windows & Doors | \$153.945 | | Flooring | \$267,421 | \$11.59 |
| | | \$270,556 | And the second s | \$42,018 | \$1.82 |
| 9 - Finishes | \$800,211 | \$830,789 | Accessories | \$38,850 | \$1.68 |
| - Specialties | \$38,850 | \$44,438 | # 100 1 100 100 100 100 100 100 100 100 | \$125,655 | \$5.45 |
| - Equipment | N/A | N/A | 7.102 Per 1000 Per 100 | \$100,000 | \$4.34 |
| ! - Furnishings | \$125,655 | \$105,837 | | \$210,515 | \$9.13 |
| - Special Construction | N/A | N/A | | \$116,325 | \$5.04 |
| - Conveying Services | \$100,000 | \$100,000 | | \$529,600 \$471,064 | \$22.96 \$20.42 |
| 300 - Fire Protection | \$116,325 | \$110,560 | nts | \$132,600 | \$5.75 |
| 400 - Plumbing | \$210,515 | \$229,982 | BTOTAL | \$5,337,603 | \$231.41 |
| 500 - HVAC | \$529,600 | \$609,347 | its (Not Required) | 33,337,003 | J2J1.41 |
| - Electrical | \$471.064 | \$449,565 | rance \$0.60/100 | \$32,026 | \$1.39 |
| | * | 77.11,000 | s General Conditions (\$40kx 14 mo.) | \$560,000 | \$24.28 |
| ade Contractors Subtotal | \$5,537,603 | \$5,634,629 | s Payment and Performance Bond 1.5% | \$50,402 | \$2.19 |
| au o o o i i i au o o o o o o o o o o o o o o o o o o | **,***, | 4-10-11-2 | s Liability \$8.5/K | \$89,700 | \$3.89 |
| - Builders Risk Insurance \$0.60/100 | \$32,026 | | action Contingency 5% | \$303,487 | \$13.16 |
| - General Contractors General Conditions | \$560,000 | \$570,636 | s Overhead and Profit 2.5% | \$159,330 | \$6.91 |
| | \$50,402 | \$69.737 | Escalation 1.5% | \$65,325 | \$2.83 |
| - General Contractors Payment and Performance Bond | | | | W/Master Budget | |
| - General and Excess Liability | \$89,700 | \$62,770 | on Contingency | W/Master Budget | |
| - Design and Construction Contingency | \$303,487 | \$271,731 | | | |
| 1 - General Contractors Overhead and Profit 1 - Construction Cost Escalation | \$159,330 \$65,325 | \$160,238 \$114,970 | n Cost | \$6,597,873 | \$286.04 |

\$6,884,711

\$6,884,711

included

\$6,797,873

\$6,872,873

\$75,000

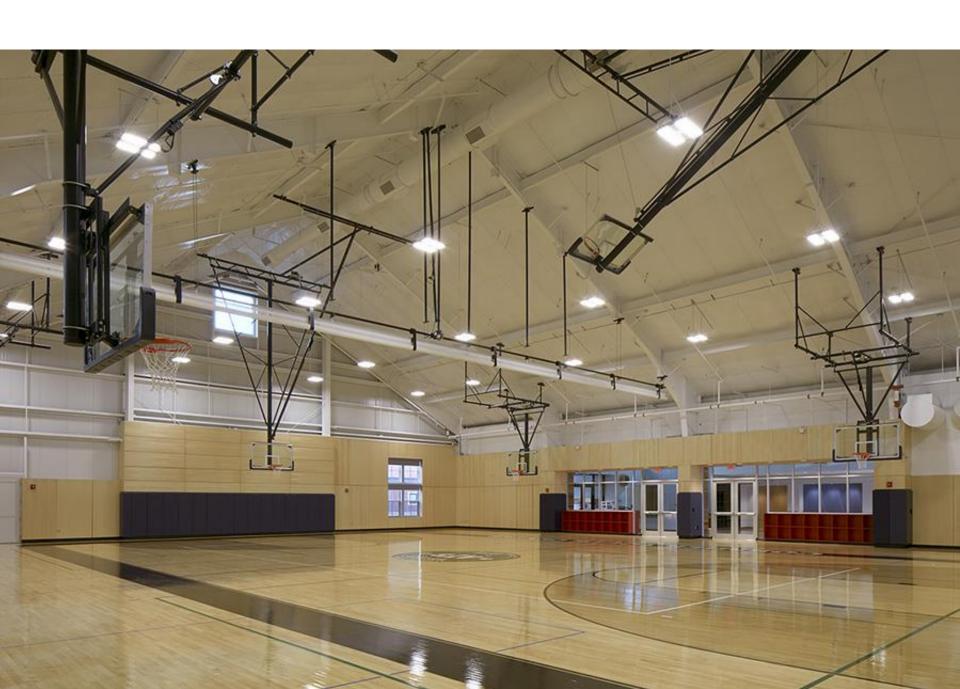
| | \$741,703 \$4,692,925 | |
|------|--------------------------|----------|
| | \$5,434,628 | \$232.55 |
| ,628 | \$271,731 | \$11.63 |
| | \$5,706,359 | \$244.17 |
| 359 | \$570,636 | \$24.42 |
| 995 | \$62,770 | \$2.69 |
| 765 | \$69,737 | \$2.98 |
| 503 | waived | |
| 503 | \$160,238 | \$6.86 |
| ,740 | \$114,970 | \$4.92 |
| 20 | \$6,684,711 | \$286.04 |
| | | |

Cost Comparisons for Alternative Sites

| COST COMPONENT | cost range High School Site #2 | | | cost range High School Site #3 | | | cost range High School Site #4 | | | cost range School Administration Site | | | | University | nge Reuse | cost range Coonamessett Inn Reuse | | | |
|--------------------------------|---|----|-------------|---|----|-------------|---|----|--------------|---|-------------|----|---|-------------|--------------|--------------------------------------|-------------|----|-------------|
| Sitework | \$1,481,000 | to | \$1,629,100 | \$1,058,000 | to | \$1,163,800 | \$2,162,000 | to | \$2,378,200 | \$ | \$1,501,000 | to | \$1,651,100 | | | | \$50,000 | to | \$155,000 |
| Building | \$6,829,000 | to | \$7,511,900 | \$6,386,000 | to | \$7,024,600 | \$7,245,000 | to | \$7,969,500 | \$ | \$7,316,000 | to | \$8,047,600 | \$2,027,000 | to | \$2,837,800 | \$2,073,000 | to | \$2,902,200 |
| Field or Playground Relocation | \$708,000 | to | \$778,800 | \$708,000 | to | \$778,800 | | | | | | | \$275,000 | \$150,000 | to | \$300,000 | | | |
| TOTAL PROJECT COST RANGE | \$9,018,000 | to | \$9,919,800 | \$8,152,000 | to | \$8,967,200 | \$9,407,000 | to | \$10,347,700 | \$ | 88,817,000 | to | \$9,973,700 | \$2,177,000 | to | \$3,137,800 | \$2,123,000 | to | \$3,057,200 |
| Negative Cost Factors | long distance to pump station field relocation required electrical service extension req'd field relocation required | | | site increases building cost | | | need to extend sewer or septic sloping site increases bldg cost potential basement or crawl space field improvements "desirable" | | | interior requires upgrade cost to relocate rec department playground relocated on or off site | | | includes accessibility (elevator) zoning of exist mechanical system fresh air and other mech upgrades modifications for SC program | | | | | | |
| Positive Cost Factors | potential existing overflow parking flat site high level of visibility close to pump station flat site stormwater management benefits | | | potential savings overflow parking no field relocation stormwater management benefits | | | | | | existing parking & access existing site utilities & drainage existing building | | | existing parking & access existing site and landscape existing building | | | | | | |

Pre-Engineered Buildings for Cost Advantage





Estimate vs. Actual Cost

Randolph Intergenerational Center **Needham Center at the Heights Sharon Senior & Community Center Boys & Girls Club, Worcester Chatham Community Center Malta Community Center & Library Chelmsford Community Centers Hyannis Youth & Community Center**

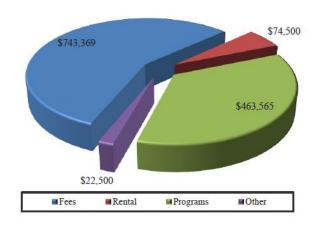
| <u>ESTIMATE</u> | <u>ACTUAL</u> |
|-----------------|---------------|
| \$10,200,000 | \$10,100,000 |
| \$6,850,000 | \$6,200,000 |
| \$8,000,000 | \$8,100,000 |
| \$7,900,000 | \$7,600,000 |
| \$6,763,000 | \$6,800,000 |
| \$6,125,500 | \$5,810,000 |
| \$4,600,000 | \$4,700,000 |
| \$16,800,000 | \$16,500,000 |
| | |
| | |

Operational Planning

| | Existing Cost | Additional Cost | Total Cost |
|----------|---------------|-----------------|------------|
| Expenses | \$35,000 | \$103,000 | \$138,000 |
| Salaries | \$202,000 | \$284,000 | \$486,000 |
| Total | \$237,000 | \$387,000 | \$624,000 |

Falmouth Senior Center

How much will new, larger building add to the existing senior/recreational budgets?



Fairbanks Community Center

What are the revenues required to make this an "expense neutral" facility for the town?

| Component | |
|------------------------------|------------------------------|
| Administrative Office Space | Indoor Aquatics ¹ |
| Conference Room | Locker Room |
| Lobby | Child Watch |
| Gymnasium Space (2) | Wet Classroom |
| Indoor Running/Jogging Track | Weight Room |
| Restrooms | Cardiovascular Space |
| Multi-Purpose Meeting Rooms | Group Exercise |
| Warming Kitchen | Classrooms (2) |

New London Community Center

What are the programs necessary and what is the cost burden of the community center on the City's budget?

Operational Cost Analysis

IMPACT OF ADDITIONAL SPACE ON THE OPERATIONAL BUDGET

| IMPAC | T OF ADDITIONAL SP. | ACE ON THE OF | PERATIONAL BUD | GET |
|------------------------------|---------------------------|----------------|------------------|------------|
| Category: Contractual | | Existing Cost | Additional Cost | Total Cost |
| Gas / Electric | | \$5,450 | \$52,500 | \$57,950 |
| Water / Sewer | | - | \$3,500 | \$3,500 |
| Advertising | | - | \$5,000 | \$5,000 |
| Communications | | \$2,100 | \$6,000 | \$8,100 |
| Trash Removal | | - | \$3,500 | \$3,500 |
| Insurance | | - | \$5,000 | \$5,000 |
| Other: Dues / Memberships | | \$2,170 | \$1,500 | \$3,670 |
| Volunteer / Elderly Services | | \$1,000 | \$0 | \$1,000 |
| | | \$10,720 | \$77,000 | \$87,720 |
| Category: Commodities | | Existing Cost | Additional Cost | Total Cost |
| Office | Supplies | \$1,125 | \$3,000 | \$4,125 |
| | enance / Repair Materials | \$2,500 | \$5,000 | \$7,500 |
| | rial Supplies | | \$6,000 | \$6,000 |
| | rogram Supplies | = | \$2,500 | \$2,500 |
| | / Meals on Wheels | \$15,000 | \$5,000 | \$20,000 |
| Unifor | ms | 2 | \$1,500 | \$1,500 |
| Printin | g / Postage | \$4,700 | \$2,000 | \$6,700 |
| Other: | : Travel | \$1,000 | \$1,000 | \$2,000 |
| | | \$24,325 | \$26,000 | \$50,325 |
| Categ | ory: Salaries | Existing Wages | Additional Wages | Total Cost |
| FT | COA Director | \$86,486 | - | \$86,486 |
| PT | Outreach Coordinator | \$24,367 | | \$24,367 |
| FT | Mini Bus Driver | \$44,970 | - | \$44,970 |
| PT | Admin. Assistant | \$45,903 | - | \$45,903 |
| FT | Program Coordinator | - | \$58,500 | \$58,500 |
| FT | Maintenance Worker | - | \$52,000 | \$52,000 |
| PT | Front Desk | - | \$43,988 | \$43,988 |
| PT | Fitness Attendant | = | \$16,891 | \$16,891 |
| PT | Kitchen Staff | - | \$61,583 | \$61,583 |
| PT | Computer Lab Attendant | - | \$17,595 | \$17,595 |
| PT | Building Attendant | Ē | ÷ | Ħ |
| PT | General Instructor I | - | \$19,872 | \$19,872 |
| PT | General Instructor II | <u> </u> | \$13,248 | \$13,248 |
| | | \$201,726 | \$283,677 | \$485,403 |
| | TOTAL | \$236,771 | \$386,677 | \$623,448 |

Operational Analysis

Schedule

We can meet or, if you desire, exceed the timeline as published:

| Feasibility Study | 3 months |
|---------------------------------------|-----------|
| Schematic Design & Site Plan Approval | 6 months |
| Design Development | 6 months |
| Construction Documents | 10 months |
| Bid, Construction, Occupancy, FF&E | 22 months |



