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INTRODUCTION

The existing Patrick Henry Recreation Center is approximately 9,400 sf of shared space with the adjacent Patrick Henry K-5 School. This feasibility study evaluates demolishing the existing Recreation Center and constructing an upgraded, new green building on the same site. Sorg architects met with the community, stakeholders and RPCA to develop an architectural program and identify priorities for the design. Information guiding the project was also obtained from the 2008 Feasibility Study done by the Lukmire Partnership, which looked at renovating and expanding the existing Recreation Center, as well as the December 2014 study by Brailsford and Dunlavey, which considered the possibility of an indoor field along with the economics of facility. In addition, the 2014 Patrick Henry Facility Survey was the basis for the programmatic functions included in the design.

PROPOSED DESIGN OPTIONS

Along with the adjacent construction of a new K-8 school, construction of a new recreation center is proposed. This study includes three different options for the Recreation Center building, indicated as Community Center Option A and B, and Neighborhood Center Option. These three options are shown in three different configurations on the site plan which is based on the Site Option 2 included in the Patrick Henry School feasibility report under separate cover. These options are indicated as option 2.1, 2.2, and 2.3.

The three building options, ranging from 17,000 to 38,000 sf, include a running/walking track, flex court, multipurpose room, and fitness room. Options A and B include an indoor multi-use recreation space, option C omits it.

This study proposes three different relationships between the Recreation Center and the School. In Option 2.1, the Recreation Center is free standing, independent from the school. In Option 2.2, the Recreation Center is attached through a corridor. From the outside, it looks like a separate structure. Doors in the corridor separate the buildings for security. In Option 2.3, the Recreation Center appears to be part of the same building as the school, though it has a separate lobby and doors to a corridor leading to the school. All of these options allow for functional separation, security, and an independent entrance for Recreation. Option 2.3 allows for the easiest access to shared spaces between the two buildings.

CONSTRAINTS

This project is influenced by several constraints:
- Location of School building
- Access to Recreation Center preferred from Taney Avenue
- Existing Recreation Center must be demolished before construction since new recreation center is in the same location
- Respecting the smaller scale residential context
- Topography
- Zoning and other regulatory requirements
- Budget

DESIGN GOALS

- Clear, separate entrance from the school
- Visibility from Taney Ave
- Continuity of open space around the Recreation Center
- Convenient site access
- Provide state-of-the-art green Recreation Center and outdoor amenities
- Deliver project design within CIP budget

CONCLUSION

All options work with the site and proposed school and are feasible for the project. Each option has a different program, cost, and architectural relationship to the school. Each design responds appropriately to the constraints highlighted above. This has resulted in each option being placed in more or less the same physical location. The northwest corner of the site balances the relationship with the school with the need for the Recreation Center to have its own independence. The advantages and disadvantages of each option are discussed in this report.

PATRICK HENRY RECREATION CENTER - FEASIBILITY STUDY

DRAFT
02.1 EXISTING SITE ANALYSIS | SITE OVERVIEW

SITE ZONING

The existing school, recreation center, parking lot, play areas, athletic fields and tennis courts are located in a R12 zone, adjacent to a wooded area at the north end of the site, which is a Public Open Space zone, a separate parcel of land. The area surrounding the site consists of several residential zones of varying density. Indoor and outdoor recreational facilities designed to serve the neighborhood are permitted per Special Uses (section 3-203, 6-105).

LOT REQUIREMENTS (SECTION 3-205)

Proposed designs comply with all lot requirements as follows:

<table>
<thead>
<tr>
<th></th>
<th>R12 Zone</th>
<th>Existing</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Lot Size</td>
<td>12,000 sf</td>
<td>568,841 SF, complies</td>
<td>No change</td>
</tr>
<tr>
<td>Minimum Lot Width</td>
<td>95 ft</td>
<td>333.44 ft, complies</td>
<td>No change</td>
</tr>
<tr>
<td>Lot Frontage</td>
<td>45 ft</td>
<td>333.44 ft, complies</td>
<td>No change</td>
</tr>
</tbody>
</table>

BULK AND OPEN SPACE REGULATIONS (SECTION 3-206, 6-106, 7-2100)

Proposed designs comply with all bulk and open space requirements as follows:

<table>
<thead>
<tr>
<th></th>
<th>R12 Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Yard</td>
<td>35 ft minimum</td>
</tr>
<tr>
<td>Side Yard</td>
<td>2 yards w/ a setback ratio of 1:1 and a min. size of 25 ft</td>
</tr>
<tr>
<td>Rear Yard</td>
<td>Setback ratio of 1:1 and a min. size of 25 ft</td>
</tr>
<tr>
<td>Special Setback</td>
<td>n/a</td>
</tr>
<tr>
<td>Landscaping</td>
<td>n/a</td>
</tr>
<tr>
<td>FAR</td>
<td>0.30</td>
</tr>
<tr>
<td>Height</td>
<td>40 ft max for school use, 60 ft max with a SUP</td>
</tr>
</tbody>
</table>
02.1 EXISTING SITE ANALYSIS | SITE FEATURES & DEFICIENCIES

- Existing grades range from flat to moderate for the majority of the site, most grades are less than 5%.
- A ridge line extends from the corner of Taney & N. Latham to an apex at the tennis court.
- Fields are not available for use by the Recreation Center or the community during school hours.
- Bus loop cuts off field from the Recreation Center.

Small-scale residential homes along N Latham St.

Site drains to a collection point at the intersection of N. Latham St and Taney Ave.

Underutilized tennis court located on a hill. Tennis court sits 15 feet higher than the rest of the property.

Recreation Center is not visible from Taney Ave. No separate identity for the Recreation Center.

Buses, cars, and service vehicles share a single drive/parking lot; unsafe and inefficient.
- No site drop-off or pick-up area.
- Insufficient site lighting.
**02.2 EXISTING BUILDING ANALYSIS | BUILDING OVERVIEW**

**BUILDING SUMMARY**
- Located on the northeast corner of the property
- Directly attached to the north wing of Patrick Henry Elementary School
- Originally built in 1973, with addition in 1990
- 9,400 SF, one-story load-bearing masonry building
- Includes multipurpose room, craft room, game room, kitchen, office, storage, and elementary school-size gym

**BUILDING DEFICIENCIES SUMMARY**
- Main entrance is not visible from the street
- Entrance is not clear, tucked behind building volumes
- Limited natural light in most interior spaces
- Low-quality original construction methods have deteriorated quickly
- Exterior envelope requires significant repair to return to a watertight condition
- Finishes show wear and tear
- Interior feels more like an extension of the school than a community Recreation Center
- Layout encourages compartmentalization rather than social interaction
- Bearing wall construction limits layout possibilities in a renovation
- Interior spaces are located such that there is no direct access to the exterior
- Existing building does not meet accessibility requirements
02.2 EXISTING BUILDING ANALYSIS | ARCHITECTURAL DEFICIENCIES

PROGRAM
- Insufficient space to accommodate programs in Needs Assessment
- No lobby space or reception
- Non-regulation size gym limits possible programs in the gym

SPACE
- Multi-purpose room has no natural light
- No waiting area for convenient pick-up/ drop-off
- Gymnasium is not divisible limiting flexibility
- Gymnasium is not regulation size limiting use for games
- Restrooms do not meet ADA requirements
- Vestibule is not large enough to act as a lobby, does not have a reception desk
- 8’-0” ceiling height in multipurpose room limits possible activities
- Small size of multipurpose rooms, 800 sf not large enough to be flexible for many uses

COMMUNITY USE
- No community access during school hours
- Current design optimizes shared use with school rather than community access

LAYOUT
- Entrance is through a corridor
- Craft room is only accessible through Multi-purpose room and Game room
- Lack of visual connection between office and main entrance
- Restrooms are not ADA compliant

OPERATIONAL
- No reception area; security concern
- Recreation Center cannot offer programming during school hours
- Unable to access school computer rooms during school hours

EXTERIOR ENVELOPE
The following deterioration was observed due to water infiltration:
- Rusting of structural steel
- Cracking masonry
- Deterioration, efflorescence and staining of exterior concrete
- Poor foundation drainage conditions
02.2 EXISTING BUILDING ANALYSIS | STRUCTURAL & MEP

**STRUCTURAL**
The existing structural system consists of:
- Steel roof joists and infill structural steel beams supported on CMU bearing walls
- Wall footings are designed for an assumed 2000 psf soil bearing pressure

**MECHANICAL**
The existing mechanical systems is 15 years old and not functioning well.
- Consists of roof top DX packaged units
- Units are inefficient and near the end of their life
- Outdated, does not meet current code

**ELECTRICAL**
The electrical distribution system is from 2011 and is 2500A, 120/208V, 3phase, 4wire switchboard with new utility meter.
- There is no generator
- Light fixtures for egress are provided with battery backup, not current technology
- Lighting fixtures are fluorescent and have reached the end of their serviceable life
- There is no centralized lighting control system

**PLUMBING**
Plumbing systems are original except for a domestic water heater, installed in 2011.
- Fixtures are inefficient
- Fixtures do not meet LEED requirements

**FIRE PROTECTION**
Building is currently not sprinklered.
NEEDS ASSESSMENT - OUTDOOR PROGRAM

The site program developed for Patrick Henry Recreation Center is based on the outdoor recreational facilities desired by the community, identified in the 2014 Patrick Henry Facility Survey, shown below. All three proposed site plan options provide flexible-use spaces to accommodate majority of outdoor activities desired by the community. The diagram on the right illustrates all outdoor activities accommodated in the proposed site plan options.

Q4. OUTDOOR Parks, Trails and Facilities Respondent Households Would Use if it was Developed at the Patrick Henry Facility

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking/biking trails</td>
<td>42%</td>
</tr>
<tr>
<td>Outdoor running/walking track</td>
<td>28%</td>
</tr>
<tr>
<td>Natural areas and wildlife habitats</td>
<td>36%</td>
</tr>
<tr>
<td>Picnic shelters</td>
<td>26%</td>
</tr>
<tr>
<td>Outdoor leisure/recreational pool</td>
<td>20%</td>
</tr>
<tr>
<td>Outdoor fitness stations</td>
<td>15%</td>
</tr>
<tr>
<td>Outdoor tennis court</td>
<td>25%</td>
</tr>
<tr>
<td>Outdoor competitive swimming pool</td>
<td>16%</td>
</tr>
<tr>
<td>Multipurpose rectangular fields</td>
<td>16%</td>
</tr>
<tr>
<td>Community gardens</td>
<td>15%</td>
</tr>
<tr>
<td>Outdoor basketball court</td>
<td>15%</td>
</tr>
<tr>
<td>Outdoor performance stage</td>
<td>13%</td>
</tr>
<tr>
<td>Outdoor rock climbing wall</td>
<td>13%</td>
</tr>
<tr>
<td>Outdoor batting cages</td>
<td>13%</td>
</tr>
<tr>
<td>Lighted sport fields</td>
<td>11%</td>
</tr>
<tr>
<td>Spray grounds</td>
<td>10%</td>
</tr>
<tr>
<td>Multipurpose sports fields (baseball and softball)</td>
<td>10%</td>
</tr>
<tr>
<td>Outdoor rope course</td>
<td>9%</td>
</tr>
<tr>
<td>Bocce courts</td>
<td>9%</td>
</tr>
<tr>
<td>Multipurpose/sports court</td>
<td>6%</td>
</tr>
<tr>
<td>Skateboard park</td>
<td>6%</td>
</tr>
<tr>
<td>Outdoor volleyball court</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
</tr>
<tr>
<td>None chosen</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: ETC Institute for the City of Alexandria Patrick Henry Survey (September 2014)

PROPOSED PROGRAMS

PLAYGROUNDS
- Volleyball
- Small-sided soccer
- Small-sided Rugby
- Small-sided Field Hockey
- Small-sided Lacrosse
- Basketball
- Outdoor Performance Space

TURF COURT
- Rugby
- Field Hockey
- Soccer
- Lacrosse
- Football
- Baseball

PAVED COURT
- Multi-use recreational space

MULTI-USE

WOODED AREA
- Natural area and Wildlife habitats
- Walking Trails
- Fitness stations
- Bike trail

Q. Proposed Site Program | Needs Assessment
03.2 PROPOSED SITE PROGRAM | DETAILED PROGRAM

SITE PROGRAM

The site program includes parking, age-appropriate playgrounds, two multi-purpose courts and one grass multi-use recreational space.

CAR PARKING

School - Per zoning requirements 2 spaces are to be provided per classroom.

Recreation Center Building Option A and B - The existing zoning code does not include a category for the indoor multi-use recreational space. The proposed number of parking spaces will accommodate the users of the recreation center and the outdoor field space. During the design phase further refinement of the number of parking spaces will be done per discussions with RPCA, T&ES, Planning and Zoning, and through the development of a traffic study.

- School Car Parking Spaces: 70 Spaces
- Recreation Car parking Spaces: 120 Spaces
- Total: 190 Spaces

Recreation Center Building Option C - Per the zoning requirements 1 parking space is to be provided for every 200 sf. Under this option 86 spaces would be required to accommodate the recreation center.

- School Car Parking Spaces: 70 Spaces
- Recreation Car parking Spaces: 86 Spaces
- Total: 156 Spaces

During the DSUP process we will investigate options to reduce the overall number of parking spaces.

PLAY AREAS

The project includes age-specific play areas for multiple age groups per community input. These play areas are to be shared with the new School.

- 1 Early Childhood Playground
- 1 Elementary Grade Playground
- 1 Open Recess Area

FIELDS

The following fields are included based on RPCA direction and the Needs Assessment:

- 1 Grass Multi-use Recreational Space
- 1 Turf Multipurpose court
- 1 Paved Multipurpose court

This is compatible with the City of Alexandria master plan for Athletic Fields.

DETAILED PROGRAM

<table>
<thead>
<tr>
<th>Space</th>
<th># Spaces</th>
<th>SF/space</th>
<th>Gross SF</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playground - Early Childhood</td>
<td>1</td>
<td>4,200</td>
<td>4,200</td>
<td>75 sf/child, min, near early childhood classrooms, maintain community access during school hours</td>
</tr>
<tr>
<td>Playground - Elementary grades</td>
<td>1</td>
<td>4,200</td>
<td>4,200</td>
<td>General receiving, away from prevailing winds</td>
</tr>
<tr>
<td>Service Entrance/Loading dock</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Turf court 80’ x 53’</td>
<td>1</td>
<td>4,240</td>
<td>4,240</td>
<td>Shared with School</td>
</tr>
<tr>
<td>Paved court 80’ x 53’</td>
<td>1</td>
<td>4,240</td>
<td>4,240</td>
<td>Shared with School</td>
</tr>
<tr>
<td>Multi-use Recreational Space, grass, 315’x210’</td>
<td>1</td>
<td>66,150</td>
<td>66,150</td>
<td>Shared with School, measured distance posted on signs</td>
</tr>
<tr>
<td>Looped track or trail</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>- Shared with School, measured distance posted on signs</td>
</tr>
<tr>
<td>Public Art</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>- Incorporate into site plan</td>
</tr>
</tbody>
</table>
03.3 PROPOSED BUILDING PROGRAM | NEEDS ASSESSMENT

NEEDS ASSESSMENT - INDOOR PROGRAM

The program developed for Patrick Henry Recreation Center building is based on the indoor recreational facilities desired by the community, identified in the 2014 Patrick Henry Facility Survey, illustrated below. All three proposed building options provide multi-use spaces to accommodate majority of indoor activities desired by the community. The diagram on the right illustrates all indoor programs accommodated in the proposed Recreation Center.

PROPOSED PROGRAMS

INDOOR MULTI-USE RECREATIONAL SPACE

ACTIVITIES ACCOMMODATED

- Bocce
- Golf simulator
- Indoor sports fields
- Indoor ropes course
- Batting cages

RUNNING TRACK

- Indoor walking/running track

FLEX COURT

- Volleyball
- Indoor playground
- Futsal
- Basketball (option c)
- Trampoline

MULTI-PURPOSE ROOM

- Lecture hall
- Wi-fi lounge
- Film/theater room
- Childcare room
- Family arts center
- Multi-purpose area
- Soft play room
- Social lounge

FITNESS ROOM

- Indoor exercise and fitness space

SCHOOL-SHARED SPACES

- Indoor performance space/theater
- Indoor gym for basketball

---

Q8. INDOOR Recreation and Cultural Arts Facilities Responder Households Would Use if Developed at the Patrick Henry Facility

by percentage of respondents (multiple selections possible)

- Indoor swimming pool: 42%
- Indoor exercise and fitness space: 32%
- Indoor running/walking track: 21%
- Lockers/showers: 18%
- Culinary Arts Center: 17%
- Wi-Fi Lounge with work stations: 17%
- Rock climbing wall: 16%
- Indoor performance space/black box theater: 15%
- Indoor mini golf course: 15%
- Indoor gym space for basketball: 14%
- Spinning studio: 14%
- Film/theater room: 13%
- Lecture Hall: 12%
- Indoor playground: 12%
- Child watch room: 11%
- Trampoline room: 11%
- Indoor sports fields: 10%
- Family Arts Center: 10%
- Multi-purpose area: 9%
- Batting cages: 8%
- Soft play room: 8%
- Social lounge: 7%
- Racquetball/squash courts: 6%
- Golf simulator room: 6%
- Indoor ropes course: 5%
- Indoor gym space for volleyball: 5%
- Indoor futsal space: 5%
- Bocce courts: 3%
- Other: 2%
- None chosen: 28%

Source: ETC Institute for the City of Alexandria Patrick Henry Survey (September 2014)
In 2008, a feasibility study was performed which contemplated the renovation and addition to the existing Patrick Henry Recreation Center. This 2008 study contemplated the expansion of the recreational center to include a number of programs that were previously unavailable. Some of the programs in this study include the following:

- Gymnasium
- Multi-purpose room
- Game Area
- Kitchen
- Adult Program Room
- Craft Room
- Fitness Room
- Dance Room
- Computer Room

The proposed program for Options A, B, and C as shown in this report takes into account the programmatic requirements of the 2008 study, the cost recovery direction of the 2014 study, and the results of the 2014 community needs assessment. Options A and B include an indoor turf multi-use recreational space similar to the one outlined in the 2014 study. Option C includes a larger flex court in lieu of this indoor turf multi-use recreational space. Each of the three proposed options meets the programmatic needs of the 2008 report and the community needs assessment through the use of multi-purpose spaces that allow for a successful cost recovery model. As shown in the spreadsheet below the proposed building program achieves this through an efficient use of space.

<table>
<thead>
<tr>
<th>Recreation Center</th>
<th>2008 PROPOSED PROGRAM</th>
<th>BRAILSFORD DUNLAVELY STUDY</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobby/Reception Area</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Administration</td>
<td>BRAG</td>
<td>848</td>
<td>700</td>
<td>Office area for 6 staff</td>
<td>700</td>
</tr>
<tr>
<td>Conference Room</td>
<td>450</td>
<td>Includes 2-100'x50' halls and stands</td>
<td>1,700</td>
<td>Includes 2-100'x50' halls and stands</td>
<td>1,785</td>
</tr>
<tr>
<td>Indoor Multi-use Recreational Space</td>
<td>0</td>
<td>0</td>
<td>Includes 2 - 100'x50' Fields and Stands</td>
<td>1,700</td>
<td>Includes 2 - 100'x50' Fields and Stands</td>
</tr>
<tr>
<td>Running Track</td>
<td>0</td>
<td>3 lane track at field level serves as runoff</td>
<td>5,856</td>
<td>12' wide runoff area at 4 sides below track</td>
<td>2,792</td>
</tr>
<tr>
<td>Indoor Multi-use Recreational Space</td>
<td>0</td>
<td>11,000</td>
<td>Includes 2 - 100'x50' Fields and Stands</td>
<td>12,000</td>
<td>Includes 2 - 100'x50' Fields and Stands</td>
</tr>
<tr>
<td>Flex Court</td>
<td>0</td>
<td>5,200</td>
<td>50'x50' Flex Court with Stands</td>
<td>2,500</td>
<td>50'x50' Flex Court</td>
</tr>
<tr>
<td>Athletic Storage</td>
<td>300</td>
<td>Includes storage</td>
<td>1,700</td>
<td>Includes storage</td>
<td>1,700</td>
</tr>
<tr>
<td>Multi-purpose Room</td>
<td>1,280</td>
<td>1,500</td>
<td>Includes storage</td>
<td>1,500</td>
<td>Includes storage</td>
</tr>
<tr>
<td>Kitchen</td>
<td>250</td>
<td>120</td>
<td>Kitchenette for staff</td>
<td>120</td>
<td>Kitchenette for staff</td>
</tr>
<tr>
<td>Adult Program Room</td>
<td>600</td>
<td>1,150</td>
<td>Includes 150 sf Storage</td>
<td>1,150</td>
<td>Includes 150 sf Storage</td>
</tr>
<tr>
<td>Craft Area</td>
<td>600</td>
<td>1,500</td>
<td>Includes 500 sf Storage</td>
<td>1,500</td>
<td>Includes 500 sf Storage</td>
</tr>
<tr>
<td>Game Area</td>
<td>1,200</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dance Room</td>
<td>700</td>
<td>9</td>
<td>Accommodated in the Multi-purpose Room</td>
<td>9</td>
<td>Accommodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Library/Computer Room</td>
<td>500</td>
<td>3,000</td>
<td>500</td>
<td>3,000</td>
<td>500</td>
</tr>
<tr>
<td>General Storage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mechanical Room</td>
<td>0</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Electrical Room</td>
<td>0</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Cubbies</td>
<td>0</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Janitor's Closet</td>
<td>0</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total Net SF</td>
<td>17,840</td>
<td>28,160</td>
<td>26,251</td>
<td>32,107</td>
<td>14,637</td>
</tr>
</tbody>
</table>

Refer to the spreadsheet for detailed information on each option.

**Note:** Area includes 5,156 sf track on second floor

**Note:** Area includes 6,048 sf track on second floor

**Note:** Includes vertical circulation
04.1 DESIGN PRINCIPLES

CITY OF ALEXANDRIA DESIGN PRINCIPLES
The following design principles were developed by Recreation, Parks and Cultural Activities (RPCA) to guide the design of Patrick Henry campus:

SITE CIRCULATION
- Site circulation integrated with building design
- Minimize impact from buses and service vehicles on outdoor recreation
- Minimize parking as a spatial focus, explore shared use of parking spaces

SITE PLAN
- Maintain community access to outdoor recreation spaces during non-school hours
- Minimize walking and surveillance distance for playgrounds
- Combine site uses if possible
- Ensure site plan and access support camp and after school programs
- Maximize potential for outdoor community events
- Maximize outdoor space by building multiple story buildings
- Ensure Athletic Facilities meet VA Guidelines for Public School Facilities
- Where possible, field shall be VA High School standard dimensions
- Integrate public art into site design
- Maximize tree canopy coverage per Urban Forestry Master Plan

BUILDING
- Clear, secure, architecturally articulated entrances
- Maximize use of existing infrastructure
- Utilize building roof as habitable and/or recreational space
- Orient building to optimize natural light and minimize energy use
- Gymnasium dimensions meet standard established at Jefferson Houston
- Include storage space for recreation and after school needs
- Allow for community control of HVAC & electrical systems separate from school
- Integrate public art into building design

PROJECT DESIGN PRINCIPLES
This project has taken design inspiration from principles identified by Alexandria RPCA and Sorg Architects, which complement each other well.

The concept for Patrick Henry stems from the physical site and community context. The natural setting is a pastoral clearing in a wooded plateau, framed by a densely forested slope to the north. Within the green surroundings lies a vibrant community, with Patrick Henry as its social focal point. The Recreation Center will serve as a lung for the community. A place to grow, learn, develop, refresh and recharge. Patrick Henry is a place that gives life to its surroundings, both physically and socially. The following design goals are essential components of the project.

- Maximize use of outdoor public space
- Optimize Recreation Center site location to be visible from the street, easily accessible, and have an appropriate relationship to the School
- Maximize open space on the site
- Efficient, secure, functional and pleasing interior layout
- Design to LEED Silver or better to serve as a sustainable model for the community
- Promote occupant health, and comfort and enjoyment through a building design that interacts with nature
**PROPOSED SITE PLANS I SITE OPTION 2.1 (COMMUNITY CENTER OPTION A & B FREE-STANDING)**

**SUMMARY**

Site option 2.1 shows a free-standing Recreation Center on the northeast corner of the site. This option works with both Community Center Option A and Option B.

**PROS**

- Recreation Center has a clear, separate identity from the School
- Recreation Center is visible from Taney Ave.
- Has no impact on the interior layout of the School
- Convenient vehicular access; drop-off/pick-up area provided near the Recreation Center entrance
- Loading area hidden behind the building

**CONS**

- Smaller open play area adjacent to the Recreation Center compared to Site Option 2.2 and 2.3
- No physical connection to School building requires walking outside to access shared spaces

*This proposed site plan is shown for illustrative purposes only and does not reflect a site decision for the School or Recreation Center*
Site option 2.2 shows the Recreation Center attached to the east wing of the School. This option works with both Community Center Option A and Option B. This option has a clear, separate identity from the School with an enclosed connection to shared spaces in the School.

**PROS**
- Recreation Center has a clear, separate entrance away from the School
- Recreation Center is visible from Taney Ave.
- Large open play area adjacent to the Recreation Center
- Connection to the school provides direct access to shared spaces
- Convenient vehicular access; drop-off/pick-up area provided near the Recreation Center entrance
- Loading area hidden behind the building

**CONS**
- Physical connection to School poses security risks for both School and Recreation Center
- The connection to the School makes site circulation difficult. Access to the rear of the site requires going around the building
This proposed site plan is shown for illustrative purposes only and does not reflect a site decision for the School or Recreation Center.

**SUMMARY**

Site option 2.2 shows the Recreation Center Neighborhood Center Option attached to the east wing of the School. This option has less separate identity from the School but provides a direct access and visibility into the shared spaces in the School.

**PROS**

- Recreation Center is visible from Taney Ave.
- Largest open play area adjacent to the Recreation Center
- Connection to the school provides direct access to shared spaces
- Convenient vehicular access; drop-off/pick-up area provided near the Recreation Center entrance
- Loading area hidden behind the building

**CONS**

- Entrance to the Recreation Center is in close proximity to the School building
- Recreation Center appears secondary to School building and lacks independent identity
## PROPOSED BUILDING PLANS | COMMUNITY CENTER OPTION A

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>PROVIDED SF</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobby/Reception</td>
<td>960</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>620</td>
<td>Office area for 6 staff</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>*</td>
<td>Provided in the school</td>
</tr>
<tr>
<td>Indoor Multi-use Recreational Space</td>
<td>12,000</td>
<td>100’ x 120’</td>
</tr>
<tr>
<td>Runoff at Perimeter of Recreational Space</td>
<td>0</td>
<td>3 lane track at field level serves as runoff</td>
</tr>
<tr>
<td>Running Track</td>
<td>5,856</td>
<td>3 lane track at field level - 12’ wide track</td>
</tr>
<tr>
<td>Flex Court</td>
<td>2,500</td>
<td>50’ x 50’ Flex Court</td>
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<tr>
<td>Athletic Storage</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Multi-purpose Room</td>
<td>1,500</td>
<td>Include storage</td>
</tr>
<tr>
<td>Kitchen</td>
<td>100</td>
<td>Kitchenette for staff</td>
</tr>
<tr>
<td>Adult-Program Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Crafts Room</td>
<td>120</td>
<td>Storage Room added to Multi-purpose Room</td>
</tr>
<tr>
<td>Weight/Fitness Room</td>
<td>1,200</td>
<td>Include 150 sf Storage</td>
</tr>
<tr>
<td>Game Area</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dance Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Library/Computer Room</td>
<td>*</td>
<td>Wi-fi to be provided throughout the facility</td>
</tr>
<tr>
<td>Toilet</td>
<td>990</td>
<td></td>
</tr>
<tr>
<td>General Storage</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Mechanical Room</td>
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<td>Electrical Room</td>
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</tr>
<tr>
<td>Cubbies</td>
<td>0</td>
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</tr>
<tr>
<td>Janitor’s Closet</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Total Gross SF</strong></td>
<td><strong>28,156</strong></td>
<td></td>
</tr>
<tr>
<td>Pre-engineered shell area</td>
<td>17,856</td>
<td></td>
</tr>
<tr>
<td>Non pre-engineered shell area</td>
<td>10,300</td>
<td></td>
</tr>
</tbody>
</table>

### SUMMARY

Community Center Option A is a one-story building scheme that can be either free-standing or attached to the new School. It has a 100’ x 120’ multi-use recreational space with a 12’ track/runoff area around the perimeter within the pre-engineered shell of the building. Flex Court, Multi-purpose Room (with a sink for Crafts), Fitness Room and Administration office are provided in the non-pre-engineered portion of the building. Community Center Option A also has a spacious main lobby area to accommodate reception and some breakout space.

### PROS
- Clear, separate entrance even when attached to the School
- Flexible design - can be attached to the new School or free-standing
- Large indoor multi-use recreational space provided
- Reception desk has visibility to both Recreation Center entrance and entrance from the school
- Large lobby area

### CONS
- Using track around the indoor multi-use recreational space as runoff space potentially creates conflict
COMMUNITY CENTER OPTION A

100' X 120' INDOOR MULTI-USE RECREATIONAL SPACE

50' X 50' FLEX COURT

SCHOOL (MODIFIED OPTION 2 SHOWN)

50' X 84' SCHOOL GYM

GROUND FLOOR PLAN

04.3 PROPOSED BUILDING PLANS I COMMUNITY CENTER OPTION A

PATRICK HENRY RECREATION CENTER - FEASIBILITY STUDY
04.3 PROPOSED BUILDING PLANS | COMMUNITY CENTER OPTION B

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>PROVIDED SF</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobby/Reception</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>790</td>
<td>Office area for 6 staff</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>*</td>
<td>Provided in the school</td>
</tr>
<tr>
<td>Indoor Multi-use Recreational Space</td>
<td>12,000</td>
<td>100' x 120'</td>
</tr>
<tr>
<td>Runoff at Perimeter of Recreational Space</td>
<td>5,856</td>
<td>12'-wide runoff area a 4 sides below track</td>
</tr>
<tr>
<td>Running Track</td>
<td>5,856</td>
<td>3 lane track at second level - 12'-wide track</td>
</tr>
<tr>
<td>Flex Court</td>
<td>2,500</td>
<td>50' x 50' Flex Court</td>
</tr>
<tr>
<td>Athletic Storage</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Multi-purpose Room</td>
<td>1,500</td>
<td>Include storage</td>
</tr>
<tr>
<td>Kitchen</td>
<td>120</td>
<td>Kitchenette for staff</td>
</tr>
<tr>
<td>Adult-Program Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Crafts Room</td>
<td>100</td>
<td>Storage Room added to Multi-purpose Room</td>
</tr>
<tr>
<td>Weight/Fitness Room</td>
<td>1,500</td>
<td>Include 150 sf Storage</td>
</tr>
<tr>
<td>Game Area</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dance Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Library/Computer Room</td>
<td>*</td>
<td>Wi-fi to be provided throughout the facility</td>
</tr>
<tr>
<td>Toilet</td>
<td>1,250</td>
<td></td>
</tr>
<tr>
<td>General Storage</td>
<td>80</td>
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<tr>
<td>Mechanical Room</td>
<td>310</td>
<td></td>
</tr>
<tr>
<td>Electrical Room</td>
<td>110</td>
<td></td>
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<tr>
<td>Cubbies</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Janitor's Closet</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Total Gross SF</strong></td>
<td><strong>36,972</strong></td>
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</table>

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>PROVIDED SF</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-engineered shell area</td>
<td>17,856</td>
<td></td>
</tr>
<tr>
<td>Second Floor Track</td>
<td>5,856</td>
<td></td>
</tr>
<tr>
<td>First Fl non pre-eng shell area</td>
<td>9,740</td>
<td></td>
</tr>
<tr>
<td>Second Fl non pre-eng shell area</td>
<td>3,520</td>
<td></td>
</tr>
</tbody>
</table>

**SUMMARY**

Community Center Option B is a two-story version of Option A that can also be either free-standing or attached to the new School. It has a 100’ x 120’ multi-use recreational space with a 12'-wide runoff area within the pre-engineered shell of the building. The second floor provides access to the 12'-wide track directly above the runoff area. Flex Court, Multi-purpose Room (with a sink for Crafts), and Administration office are located on the ground floor of the building while the Fitness Room is located on the second floor in close proximity to the elevated track.

**PROS**

- Clear, separate entrance, even when attached to the School
- Flexible design - can be attached to the new School or free-standing
- Two-story scheme allows tall ceiling height for the lobby adding a sense of spaciousness; ample lobby space provided
- Large indoor multi-use recreational space provided
- Runoff area around the multi-use recreational space provides space for spectators, staging and warm-ups
- Elevated track above the field creates a viewing deck
- Second floor open to Flex Court below, creates viewing deck

**CONS**

- Two-story scheme has higher cost
COMMUNITY CENTER OPTION B

GROUND FLOOR PLAN

SECOND FLOOR PLAN

100' X 120' INDOOR MULTI-USE RECREATIONAL SPACE

50' X 50' FLEX COURT

12' WIDE RUNOFF

ATHC STO

TOILET

TOILET

ADMIN

MULTI-PURPOSE

ATHC STO

TOILET

TOILET

FITNESS

12' WIDE TRACK

OPEN TO BELOW

OPEN TO BELOW

OPEN TO BELOW

ROOF BELOW

DRAFT
### PROPOSED BUILDING PLANS | NEIGHBORHOOD CENTER OPTION

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>PROVIDED SF</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobby/Reception</td>
<td>1120</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>700</td>
<td>Office area for 6 staff</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>*</td>
<td>Provided in the school</td>
</tr>
<tr>
<td>Indoor Multi-use Recreational Space</td>
<td>0</td>
<td>Eliminated in this scheme</td>
</tr>
<tr>
<td>Runoff at Perimeter of Recreational Space</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Running Track</td>
<td>3,792</td>
<td>3 lane track - 12’ wide track at lower level</td>
</tr>
<tr>
<td>Flex Court</td>
<td>4,200</td>
<td>50’ x 84’ Flex Court</td>
</tr>
<tr>
<td>Athletic Storage</td>
<td>306</td>
<td></td>
</tr>
<tr>
<td>Multi-purpose Room</td>
<td>1,600</td>
<td>Include storage</td>
</tr>
<tr>
<td>Kitchen</td>
<td>100</td>
<td>Kitchenette for staff</td>
</tr>
<tr>
<td>Adult-Program Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Crafts Room</td>
<td>840</td>
<td>Separate Craft Room</td>
</tr>
<tr>
<td>Weight/Fitness Room</td>
<td>1,200</td>
<td>Include 150 sf Storage</td>
</tr>
<tr>
<td>Game Area</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dance Room</td>
<td>*</td>
<td>Accomodated in the Multi-purpose Room</td>
</tr>
<tr>
<td>Library/Computer Room</td>
<td>*</td>
<td>Wi-fi to be provided throughout the facility</td>
</tr>
<tr>
<td>Toilet</td>
<td>1,030</td>
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</tr>
<tr>
<td>General Storage</td>
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<tr>
<td>Mechanical Room</td>
<td>336</td>
<td></td>
</tr>
<tr>
<td>Electrical Room</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Cubbies</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Janitor’s Closet</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Total Gross SF</strong></td>
<td><strong>17,116</strong></td>
<td></td>
</tr>
</tbody>
</table>

**SUMMARY**

Neighborhood Center Option is a one-story building scheme with no indoor multi-use recreational space. Instead, a larger (50’ x 84’) Flex Court is provided with a 12’ track around its perimeter that doubles as a runoff area. In addition to the Multi-purpose Room and Fitness Room also provided in the other building options, this option provides a separate Crafts Room providing more rooms for programming. This option also has the most spacious main lobby area with visibility to all entrances/exits, Recreation Center Flex Court and School Gym.

**PROS**

- Separate Crafts Room
- Large lobby/reception area
- Reception desk has visibility to both the Recreation Center Flex Court and the School gymnasium
- Reception desk has visibility to both Recreation Center entrance and entrance from the School
- Multi-purpose Room can be divisible for multiple events to occur simultaneously

**CONS**

- No indoor multi-use recreational space. 50’ x 84’ Flex Court provided instead.
- Using track around the indoor multi-use recreational space as runoff space potentially creates conflict
- Recreational Center entrance is in close proximity to the School building
- No free-standing option
**04.3 PROPOSED BUILDING PLANS | NEIGHBORHOOD CENTER OPTION**

- **CONCEPTUAL DESIGN OPTION #3 - ONE-STORY RECREATION CENTER BUILDING (NO TURF FIELD)**
  - Adjacent to new or existing school
  - 12' wide track
  - 50' x 84' Flex Court
  - School Gym
  - Office
  - School Multi-Purpose Room
  - School Black Box Theater
  - Fitness
  - Toilet
  - Administration Office area for 6 staff
  - 3 lane track around flex court
  - 12' wide track
  - 50' x 84' Flex Court
  - Include storage
  - Kitchenette for staff
  - Accommodated in the Multi-purpose Room
  - Include 150 sf Storage
  - Accommodated in the Multi-purpose Room
  - Wi-fi to be provided throughout the facility
  - Gymnasium
  - Indoor Multipurpose Field (Turf)
  - Runoff at Perimeter of Field
  - Running Track
  - Flex Court
  - Athletic Storage
  - Multi-purpose Room
  - Kitchen
  - Adult-Program Room
  - Crafts Room
  - Weight/Fitness Room
  - Game Area
  - Dance Room
  - Library/Computer Room
  - Toilet
  - General Storage
  - Mechanical Room
  - Electrical Room
  - Cubbies
  - Janitor’s Closet

---

**NOTES PROPOSED PROVIDED SF**

**GROUND FLOOR PLAN**
05.1 PROPOSED CIVIL STRATEGIES

STORMWATER
The completed project will include stormwater mitigation practices as needed to meet code requirements for stormwater quality and quantity as defined in the 2014 City Ordinance.

WATER QUALITY
- Storage requirements will range from 11,470 cf to 12,808 cf.
- Green roofs on school buildings
- Bio-retention areas
- Dry swale
- Permeable pavers
- Rainwater harvesting for use in irrigation
- Possible outdoor classrooms integrating stormwater management techniques

WATER QUANTITY
- Prevent erosion and flooding
- Existing outfall from site will be sufficient in new design
- Bio-retention areas and swales
- Underground stormwater facilities

PARKING
Refer to section 03.2 Proposed Site Program, for proposed parking.

PROPOSED GRADING & DRAINAGE
- New school & Rec center will be graded and sited in a fashion that allows the existing school to continue to function during construction.
- Existing drainage patterns will need to be mostly maintained.
- The new school and recreation building will be relatively close in finished grade elevations to maintain a walkable and accessible site.
- New construction will balance cut & fill with cuts from construction used to replace the void left from the demolition of the existing school and creation of proposed fields.
- Cut material from the removal of the existing tennis courts will be transferred to the new parking lots and the areas to the south and west of the site.
- Loop road will approach grades 10 - 12 feet higher than the rest of the site as rounds the northwest corner of the site
- The new buildings will sit at moderate grade slightly above Taney Avenue and North Latham Avenue to accommodate the drainage patterns from the north side of the site.
- Runoff will be captured, treated and directed to the current outfalls via a storm pipe network that will be design around the existing school.
- All stormwater management will occur on-site.
INTRODUCTION
Options A & B include a pre-engineered structure, option C does not. Recommendations for a structural system for each option are as follows:

COMMUNITY CENTER OPTION A
• The structural engineer will design the foundation of the pre-engineered long span structure as well as the 2-Story Facility Space.
• The adjacent Facility Space will be a steel framed structure, with CMU or light gauge infill walls.

COMMUNITY CENTER OPTION B
• The structural engineer will design the foundation of the pre-engineered long span structure as well as the 2-Story Facility Space.
• The prefabricated long span structure design will need to accommodate the elevated running track. Calculations shall include consideration of vibrational and impact loads for the elevated track.
• The adjacent Facility Space will be a steel framed structure, with CMU or light gauge infill walls.
• The elevated Second Floor will need to be evaluated for proposed fitness space use including vibrational aspects associated with weight lifting and cardio equipment.

NEIGHBORHOOD CENTER OPTION
• Framing of the recreational addition to school Option 2 will consist of structural steel columns supported on shallow spread footing foundations.
• Steel wide-flange girders span between steel columns to extend the grid of structural bays.
• The roof structure will consist of 2+” normal-weight concrete slab over 1-1/2” 20 GA metal deck (assumed total depth of 3+”) spanning between open-web steel joists spaced at 5’-0” on center spanning from exterior perimeter walls to the corridor walls.
• The roof structure over the flex court with perimeter walking/running track will be framed with long-span steel trusses to perimeter steel columns and/or CMU bearing walls.
• In order to accommodate the open geometry and proposed window framing between structural steel framing, the lateral system may consist of structural steel Braced Frames or Moment Frames.

1. Braced Frames:
   Cons: Diagonal braces between columns may visually extend through open glass extents at exterior and interior walls.
   Pros: Reduced size of structural steel framing (weight)
   Connections are less expensive and labor intensive as compared to moment frame connections.

2. Moment Frames:
   Cons: Column and beam framing sizes are significantly heavier per linear foot than required for braced frames. Often increase required depth of ceiling structure.
   Connections are more expensive and labor intensive.
   Pros: Allows for large extents of visually uninterrupted glass extents at exterior and interior walls.
MECHANICAL SYSTEM

INTRODUCTION
The Recreation Center will feature state-of-the-art HVAC systems throughout.

NEW BUILDING HVAC SYSTEMS
Depending on the system type, the recreation center can either be connected to the Elementary School mechanical system or can be totally independent. The following highly efficient systems could be used for the Recreation Center:

- DX Rooftop Packaged Cooling with Natural Gas Heat
- Water Cooled Chillers with Natural Gas Boilers
- Water Source Heat Pumps with Geothermal Ground Source Piping

For the indoor multi-use field:
- Large propeller fans and radiant heating can maintain the space at a temperature between 80°F - 85°F in the summer and 70 °F in the winter.
- To achieve a cooler summer environment, HVAC systems similar to the school and the remainder of the Recreation Center could be utilized, depending on owner preference and at an additional cost.

ELECTRICAL SYSTEM

The following electrical service components are recommended:
- Complete lightning grounding protection system
- LED lights throughout
- Lighting control system including occupancy sensors and time clocks
- Daylight harvesting where appropriate
- New fire alarm system

PLUMBING SYSTEM

New plumbing fixtures to preserve resources and reduce energy
- Low flow fixtures
- High efficiency water heaters
- Domestic hot water circulation loops

FIRE PROTECTION SYSTEM

The new Recreation Center will be equipped with a fire protection system to meet current code. Some features include:
- Automatic sprinkler system throughout
- Sprinkler fire pump if necessary
- New fire detection and monitoring system
05.4 PROPOSED SUSTAINABILITY STRATEGIES

INTRODUCTION

The new or renovated Patrick Henry School is envisioned to be a high performance sustainable building. Integrated design will be used throughout the process to create an exemplary green building with a reduction in energy consumption of 30% - 40%. The building will be LEED Silver minimum and net zero options will be investigated.

ENVELOPE

• Increased insulation
• Reflective or green roof
• Balanced ratio of windows to walls
• High performance glazing
• External shading

ENERGY USAGE

• LED lights
• Daylight and occupancy sensors
• Energy-efficient equipment

HVAC EFFICIENCY

• Occupancy or CO2 sensors to regulate ventilation
• High efficient energy recovery equipment

SITE SUSTAINABILITY OPTIONS

• Ground source heat pumps
• Photovoltaics
• A reduction in the amount of site parking below that required by zoning will be investigated
05.4 PROPOSED SUSTAINABILITY STRATEGIES

LEED CERTIFICATION

The design options were evaluated to determine the preliminary LEED New Construction scorecards.

The Recreation Center will use the LEED 2009 rating system. Depending on the option developed, more information will be needed to move credits from the ‘maybe’ categories into either a ‘yes’ or a ‘no’. These are early conservative estimates which need to be confirmed as the project moves into the design stages.

The LEED Campus Certification option is a way to reduce costs and streamline the certification process for projects that share a site and are owned by a single entity. As part of a Campus Certification, certain prerequisites and credits are reviewed and pre-approved as campus credits. All prerequisites and credits earned as part of the campus “master site” can be claimed by all LEED projects within that master site, thereby reducing documentation requirements, saving time and costs. There are additional costs for the Campus Certification, but individual projects located within the master site receive discounted fees.
## 06.1 Project Cost Summary

<table>
<thead>
<tr>
<th>Components</th>
<th>Community Center Option A</th>
<th>Community Center Option B</th>
<th>Neighborhood Center Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Recreation Center</td>
<td>$5,728,037</td>
<td>$6,914,709</td>
<td>$4,071,429</td>
</tr>
<tr>
<td>Building Demolition</td>
<td>$86,283</td>
<td>$86,283</td>
<td>$86,283</td>
</tr>
<tr>
<td>Site Work</td>
<td>$1,664,454</td>
<td>$1,664,454</td>
<td>$1,664,454</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$7,478,774</td>
<td>$8,665,446</td>
<td>$5,822,166</td>
</tr>
</tbody>
</table>
06.2 PROJECT LIFE CYCLE COST

RECOMMENDATIONS

Space differences in regards to each option may play a role in selection. For the DX Rooftop Packaged units, this option requires the least amount of space within the building. Equipment is located on the roof, ductwork is distributed through the school and terminal boxes are located above the ceiling. The chiller/boiler package will require a central mechanical room, and mechanical rooms to house Air Handling Units. Terminal boxes and ductwork will be located above the ceilings. For the Water Source Heat Pump option, the heat pumps will be located above the ceiling with the ductwork. There will be a small mechanical room housing the pumps and piping manifolds.

The Life Cycle Cost Analysis (LCCA) provides valuable economic data to make an educated recommendation for the HVAC systems. The recommendation for the system is based on sustainability objectives, first costs, and operating costs. Based on the LCCA, Arup views the DX Rooftop Packaged Units as the most economical, sustainable, and overall best package from a value standpoint. This system will provide the required zoning, the best temperature reset, and also provide the energy usage and savings for the school. If high efficient DX Roof Top Units are selected with energy recovery, step down capacity reduction and variable speed fans, these units will provide reliable and dependable systems for the facility.

<table>
<thead>
<tr>
<th></th>
<th>INITIAL COST</th>
<th>YEARLY UTILITY COST</th>
<th>MAINTENANCE COST</th>
<th>LCCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX ROOFTOP PACKAGED UNITS</td>
<td>$5,855,850</td>
<td>$98,807</td>
<td>$45,000</td>
<td>$8,370,928</td>
</tr>
<tr>
<td>CHILLERS AND BOILER PACKAGE</td>
<td>$6,084,000</td>
<td>$85,311</td>
<td>$60,000</td>
<td>$7,683,312</td>
</tr>
<tr>
<td>WATER SOURCE HEAT PUMPS WITH GEOTHERMAL</td>
<td>$7,605,000</td>
<td>$59,694</td>
<td>$52,000</td>
<td>$10,099,783</td>
</tr>
</tbody>
</table>
# 7.1 Comparison of Design Options

## Requirements

<table>
<thead>
<tr>
<th>Site Option 2.1</th>
<th>Site Option 2.2</th>
<th>Site Option 2.3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meets Rec Center Program</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Meets Site Program</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Site Organization</strong></td>
<td>Recreation Center is free-standing on the northeast corner of the site. Both building option A and B works with this site plan.</td>
<td>Recreation Center is attached to the east wing of the new School. Both building option A and B works with this site plan.</td>
</tr>
<tr>
<td><strong>Building Organization</strong></td>
<td>Community Ctr A - 1-story scheme with an indoor multi-use recreational space</td>
<td>Community Ctr A - 1-story scheme with an indoor multi-use recreational space</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>Existing Recreation Center to be demolished before construction</td>
<td>Existing Recreation Center to be demolished before construction</td>
</tr>
<tr>
<td><strong>Parking</strong></td>
<td>120 spaces estimated for Rec Center 70 spaces for School. Total-190 spaces</td>
<td>120 spaces estimated for Rec Center 70 spaces for School. Total-190 spaces</td>
</tr>
<tr>
<td><strong>Open Space</strong></td>
<td>Smaller open play area adjacent to the Recreation Center</td>
<td>Large open play area adjacent to the Recreation Center</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>$7,478,774 (Community Center A) $8,665,446 (Community Center B)</td>
<td>$7,478,774 (Community Center A) $8,665,446 (Community Center B)</td>
</tr>
</tbody>
</table>