Quinta-Gamelin Community Center: Architectural Design

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Authors

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Quinta-Gamelin Community Center

Community Partner:
Town of Bristol, Rhode Island

Academic Partners:
School of Architecture, Art and Historic Preservation
School of Engineering, Computing and Construction Management

Spring 2013
The Roger Williams University Community Partnerships Center

The Roger Williams University (RWU) Community Partnerships Center (CPC) provides project-based assistance to non-profit organizations, government agencies and low- and moderate-income communities in Rhode Island and Southeastern Massachusetts. Our mission is to undertake and complete projects that will benefit the local community while providing RWU students with experience in real-world projects that deepen their academic experiences.

CPC projects draw upon the skills and experience of students and faculty from RWU programs in areas such as:

- American Studies
- Architecture and Urban Design
- Business
- Community Development
- Education
- Engineering and Construction Management
- Environmental Science and Sustainability
- Finance
- Graphic Design
- Historic Preservation
- History
- Justice Studies
- Law
- Marketing and Communications
- Political Science
- Psychology
- Public Administration
- Public Relations
- Sustainable Studies
- Visual Arts and Digital Media
- Writing Studies

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2. The deliverables generated hereunder are intended to provide conceptual information only to assist design and planning and such are not intended, nor should they be used, for construction or other project implementation. Furthermore, professional and/or other services may be needed to ultimately implement the desired goals of the public in ownership of the project served.
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Introduction

In the 1990s, the YMCA in the town of Bristol closed, leaving local residents without a wellness center to attend. In 2006, the Department of Defense closed the Quinta-Gamelin Army Reserve building in Colt State Park in Bristol. In 2013, the Department of Defense officially turned the facility over to the town of Bristol Parks and Recreation Department with the understanding that it will always be used as a community center and sponsored by a federal agency — the National Park Service.

In the spring of 2013, students from the School of Architecture, Art and Historic Preservation enrolled in ARCH 488 - Computer Applications for Professional Practice, taught by Professor Gary Graham. Graham used the Quinta-Gamelin Community Center as a model to explore new Professional Practice methods, specifically the Integrated Project Delivery (IPD) and the meaning and methods of Building Information Modeling (BIM) as it pertains to design and decision-making in today’s contemporary architecture practice.

Students also worked collaboratively with other Roger Williams University students enrolled in Professor Gokhan Celik’s Construction Management 260 course to perform cost estimation for the new Quinta-Gamelin Community Center.

The course simulated an integrated design process in which individual stakeholders lent their particular expertise and bias to the design process. Following the methods of Integrated Project Delivery and using Building Information Modeling, students developed a feasible project for the renovation of the Quinta-Gamelin Army Reserve Center into a new community center for the town of Bristol, Rhode Island.

What follows in this book is a compilation of work from the student teams.
In our first design strategy, we explored the option of putting most of the new program into the existing building. This design was an exercise to understand how much of the existing building could be utilized for its new requirements.

This strategy only allowed us to fit a fraction of the required program in the site. Understanding that the program would require approximately double the amount of space, we proposed a renovated option to the town of Bristol. This option would bring the existing building up to date as well as provide the best equipment for the facility.

The proposed plan has administration spaces in the south rooms, providing them with natural sunlight during most of the day. The majority of the public community and social spaces occupy much of the area in the existing building, with utilities and additional fitness spaces occupying any remaining space.
Team 1
Design Option 2

In our second design strategy, we expanded the existing building slightly to accommodate space for the proposed pools and additional programming.

The interior of the original building below the gymnasium has been cleared and reorganized to better suit the desired building program. The eastern wall was bumped out to provide an area for administration spaces. We kept all fitness spaces in the northern half of the building, allowing the core of the building to have space available for seniors and administration support. The southern rooms of the building were designed to create community social spaces.
Team 1
Design Option 3

In our third design strategy, we explored a more radical change to the building — allowing the proposed program uses to fit inside the existing space. This layout would place all programming dealing with fitness at the southern half of the building and leave the remaining space open for public programming and administration.

1. Proposed floor plan for Design Option 3.
2. Energy analysis for Design Option 3 using a 2 pipe fan coil system.
Team 1
Final Design

Exterior southeast perspective.
Elevations:
Purple areas represent Phase 1 of the project, and pink areas represent Phase 2.
1. East elevation
2. West elevation
1. Gymnasium.
2. Aerial perspective of community center.
3. Recreation and therapy pool.
## Team 1

### Cost Analysis

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Includes Gymnasium + Daycare</th>
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<table>
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<td><strong>Cost per SF:</strong></td>
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**Total Costs:** $3,903,440  
**Total Contractor Fees:** $975,859  
**Total Architect Fees:** $351,308  
**Finished Totals:** $5,230,607
Team 2
Design Options

Design Option 1
- Conserves most of the existing building.
- Related massing.
- Leaves room for an open courtyard space.

Design Option 2
- Large service area.
- Allows full size pools.
- More expensive and expansive scheme.
Design Option 3 (Preferred Scheme)

- Connects to new daycare center.
- Expanded gymnasium.
- Most compact.
Evolution of the project into its final design.
Team 2
Final Design

Proposed front entrance to community center.
1. Section through gymnasium and exercise room.
2. Section through gymnasium and lane pool.
1. East elevation
2. South elevation
1. Lane pool
2. Gymnasium
3. Playground view
Team 3
Project Narrative

The Quinta-Gamelin Community Center project will be developed on a 5.3-acre property in Bristol, Rhode Island. It will include a community youth center, summer fun camp, pre-school and mom’s club space, senior citizen’s lounge, fitness center, swimming pools, administrative space and garage. The center will fulfill the needs of Bristol adults and youth as an educational gathering place, while creating a community zone with the surrounding recreational park and waterfront.
Team 3
Final Design

View from Asylum Road.
Floor plan exhibiting three phases of development.
1. Front elevation

2. Section A
1. Gymnasium
2. Pool
3. Front entrance
Final performance analysis of energy costs.
Cost analysis of each phase of the project.

### Phase 1 - Completion
- **Task Name:** Pre-work
  - **Duration:** 29 days
  - **Start:** May 13, 2014
  - **Finish:** May 30, 2014
  - **Cost:** $55,195.49

- **Task Name:** Shell
  - **Duration:** 42 days
  - **Start:** May 6, 2014
  - **Finish:** May 28, 2014
  - **Cost:** $199,017.46

- **Task Name:** Interior
  - **Duration:** 36 days
  - **Start:** May 11, 2014
  - **Finish:** May 26, 2014
  - **Cost:** $231,303.73

- **Task Name:** Services
  - **Duration:** 9 days
  - **Start:** May 18, 2014
  - **Finish:** May 26, 2014
  - **Cost:** $43,273.01

- **Task Name:** Mechanical Systems
  - **Duration:** 6 days
  - **Start:** May 20, 2014
  - **Finish:** May 26, 2014
  - **Cost:** $14,000.00

**Phase 1 Completion:**
- **Total Cost:** $1,148,678.92

### Phase 2 - Completion
- **Task Name:** Building Stairs
  - **Duration:** 18 days
  - **Start:** June 14, 2014
  - **Finish:** June 28, 2014
  - **Cost:** $44,000.00

- **Task Name:** Shell
  - **Duration:** 52 days
  - **Start:** June 9, 2014
  - **Finish:** July 3, 2014
  - **Cost:** $455,123.84

- **Task Name:** Interior
  - **Duration:** 12 days
  - **Start:** July 8, 2014
  - **Finish:** July 19, 2014
  - **Cost:** $142,889.73

- **Task Name:** Services
  - **Duration:** 2 days
  - **Start:** July 16, 2014
  - **Finish:** July 18, 2014
  - **Cost:** $25,203.56

- **Task Name:** Mechanical & Electrical Systems
  - **Duration:** 8 days
  - **Start:** July 17, 2014
  - **Finish:** July 25, 2014
  - **Cost:** $148,000.00

**Phase 2 Completion:**
- **Total Cost:** $1,100,188.16

### Phase 1, 2, 3 (W/ FEES)
- **Total Cost (inc fees):** $4,333,960.17

### Architect fee 6%
- **Phase 1:** $88,920.44
- **Phase 2:** $69,610.09
- **Phase 3:** $171,855.12

### CM Fee 2%
- **Phase 1:** $22,971.48
- **Phase 2:** $25,203.56
- **Phase 3:** $57,285.04

**Final cost (fee's included):**
- **Phase 1:** $1,240,567.83
- **Phase 2:** $1,252,981.70
- **Phase 1, 2, 3:** $4,333,960.17
Team 4

Phase 1: Existing Building and Landscape
- Demolish existing designated walls, flooring and second floor.
- Demolish back lot.
- Create basketball court in southwest corner.
- New floor and walls in existing basketball court.
- New locker rooms and restrooms.
- Connect to bike path.
- Clean up southwest brush and trees.

Phase 2: Main Thruway and Daycare
- Demolish existing designated walls and flooring.
- Create space for primary passage.
- New walls and floor.
- New interior partitions.
- Demolish interior of garage.
- Addition to existing garage shell to create daycare.

Phase 3: Adult Wing
- Demolish existing designated walls.
- New walls and floor in adult wing.

Phase 4: Outdoor Pool
- Excavate land for new pool.
- Pour new pool.
Team 4
Final Design
Section drawings
## Cost Analysis of the Project

### Substructures
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### Roof Construction
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### Exterior Windows & Doors
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### Furnishings & Fixtures
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**Purposes of the Cost Analysis**
- To evaluate the cost effectiveness of the project.
- To ensure that the budget is allocated efficiently.
- To identify areas where cost savings can be achieved.

**Cost Breakdown**
- Substructures: 60%
- Roof Construction: 20%
- Exterior Windows & Doors: 10%
- Furnishings & Fixtures: 10%

**Notes**
- The total cost of the project is $318238.00.
- The cost per square foot is $2100.

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**Acknowledgments**
- Community Partnerships Center at Roger Williams University
- Quinta-Gamelin Community Center
Team 5
Final Design

Phase 1: Rehabilitation, Demolition and Reconstruction

1. Rehabilitate existing building and structure
   - Offices
   - Community social spaces, teen spaces, service space

2. Demolish and reconstruct
   - New gymnasium and structure
   - Snack bar and kitchen
   - Daycare
   - Running track
Phase 2: Construction of Lap Pool

- Lap pool and seating
- Major circulation corridors
- Fitness rooms
Phase 3: Construction
- Therapy pool
- Emergency egress from second floor

Phase 4: *Pending
- Roof garden over existing building
- Landscape for main entry
1. Gymnasium and running track
2. Lap pool
3. Entry perspective
1. Section through swimming pools.

2. Section through gymnasium.
Team 6

Goals and Metrics

Sustainability
Keep maximum amount of the existing building throughout the design process. This will significantly cut costs by recycling existing walls.

Include all wanted program at actual size
Begin with all programming included at regulation size. $2.5 million proposal will include maximum amount of program still at regular size. Change the gymnasium size to meet regulation guidelines.

Take advantage of natural light
Maximize the use of glass to increase the amount of natural light in the building. Use natural life to decrease energy costs and unite the building with the park.

Analysis of Project Viability

Camp registration
By having indoor space to keep camps open on rainy days, there will be an increase in the number of families participating in the program, resulting in increased revenue.

Field and facility use
The new facility will add meeting space for many of community organizations and sport leagues as well as people interested in renting the gymnasium and meeting rooms. Last year our community center gymnasium was given out 192 times on an average of two hours each, our meeting room was given out 68 times. Similar towns rent these facilities at approximately $15.00 an hour.

Booth fees
The revenue generated by the Booth will slightly increase as the popularity of the complex increases.

Membership fees
This new Recreation Center will include a membership fee which we project to be $75.00 a year for individuals and $150.00 a year for families.

Personnel
The new facility will require one additional full time maintenance worker as well as 2 or 3 additional part time workers depending on hours of operation.

Utilities
After consulting with our Town Treasurer and comparing it with a similar building such as the Bristol Police Station, we are confident that by vacating the Bristol Community Center on Thames Street we will be transferring utility cost to a building which is significantly more energy efficient.
Team 6
Cost Estimate

Town of Bristol
Proposed Community Center
Conceptualization Cost Estimate

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<th>Description</th>
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MASTER PLAN
PROJECT COST: $9,560,750.00

GROSS SQ. FT: 41,960

REVISED PROJECT COST: $2,088,730.73 + FURNITURE, FINISHES, AND SITEWORK
AVAILABLE: $2,500,000.00

GROSS SQ. FT: 28,376
Team 6
Final Design

Exterior and front entrance
1. Master plan
2. $2.5 million revised plan
1. East elevation
2. South elevation
Team 7
Design Option 1

This scheme utilizes the pool and the gym as a major programmatic element, and the design is built around these two pieces. This design maintains much of the required program by building upward and utilizing a second floor instead of keeping everything in a single story. Thus, the gym and the pool become focal points for the project.
Team 7
Design Option 2

This scheme uses much of the existing building by gutting the building and then re-programming it. The design requires demolishing a vast amount of interior walls while maintaining the exterior skin of the building. It uses all of the programmatic elements required by the client.
Team 7
Design Option 3

This scheme builds out to the western portion of the site with a program geared towards youth. Some of the existing building will be re-used as a gym. This design does not include the idea of having a future pool.
Team 7
Final Design

Proposed 3D rendering and floor plan of final design.
1. Building elevation of the basketball court.

2. Building elevation depicting new structure for the pool complex.
Building sections illustrate (1) a proposed new roof over the basketball court and (2) the pool complex in Phase 2 of the project.
Team 7
Cost Analysis

Phase 1

- Renovate existing building.
- Demolish interior partitions while maintaining existing exterior façade.
- Addition of basketball court inside the footprint of the existing building.
- Addition of central lobby space.
- Lifting roof and addition of new steel structure to support the building and achieve maximum playing height.

Estimated Cost:

$1,582,284.00  Phase 1, New Construction
+ $80,000.00  Phase 1, Demolition

$1,662,284.00
× 40  Mechanical

$2,327,197.00  +
2%  Base Design Fees

$2,373,740  +
15%  Contingency

$2,729,801.00
Phase 2

- Expand existing building.
- Add space for a daycare.
- Addition of pool complex.
- Installation of new mechanical systems throughout complex.

Estimated Cost:

$1,765,600.0  Phase 2, New Construction +
$0.0  Phase 2, Demolition

$1,765,600.0
x .40  Mechanical

$2,471,840.00 +
2%  Base Design Fees

$2,521,276 +
15%  Contingency

$2,899,467
Phase 3

- Addition of courtyard and connecting paths to unite new and existing construction.
- Could be combined with Phase 2.

**Estimated Cost:**

$350,000.00  Phase 3, New Construction +
$0.00  Phase 3, Demolition

$350,000.00 +
2%  Base Design Fees

$357,000.00 +
15%  Contingency

$410,550.00
Team 8
Final Design

Goals

Promised Program Elements
The focus of this goal is to provide the client and owner with their "must have" elements. Although, seemingly impossible in the current footprint, a full size gymnasium, heated therapy pool, and an at minimum, 6 lane lap pool is to be included at some phase to this project to be able to fulfill this goal.

Environmental Sensitivity
The following three topics relate to the client's wishes for an environmentally sustainable complex. These three conditions must be fulfilled to accomplish this goal, but by no means limits other green building features.
Energy Efficiency
When analyzing the complex and energy usage through different means such as Green Building Studio or Autodesk Revit’s energy analysis feature, it becomes apparent how much energy is used to run this 12/7 facility off of the city grid. With the introduction of renewable energy resources, the complex is to achieve a 50% setback of energy costs, thus resulting in the complex itself creating 50% of its energy usage needs based upon such studies.

Renewable Energy Supply
As previously mentioned, a type of renewable energy resource will be required to fulfill this goal. This includes, but is not limited to, photovoltaic panels, rainwater distribution, composting toilets, triple glazed glass, greenhouse heat storage, etc. LEED Rating At a minimum, the complex must reach a Silver status when compared against the LEED scorecard.
1. Pool
2. 3D rendering
3. Floor plan showing Phase 3 of the project, which includes the pool.
Phase 3 elevation and section drawings.

Quinto-Gamelin Community Center   |  60
### Energy Analysis

#### Quinta-Gamelin Community Center

<table>
<thead>
<tr>
<th></th>
<th>Alternatives 1</th>
<th>Alternatives 2</th>
<th>Alternatives 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>485.90</td>
<td>388.00</td>
<td>485.40</td>
</tr>
<tr>
<td>Monthly</td>
<td>40.40</td>
<td>33.00</td>
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<tr>
<td>Daily</td>
<td>1.35</td>
<td>1.07</td>
<td>1.35</td>
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<tr>
<td>Hourly</td>
<td>0.05</td>
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</tbody>
</table>

#### Energy Use (kWh)

<table>
<thead>
<tr>
<th></th>
<th>Alternatives 1</th>
<th>Alternatives 2</th>
<th>Alternatives 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>88,099.00</td>
<td>105,015.00</td>
<td>88,099.00</td>
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<tr>
<td>Monthly</td>
<td>7,341.58</td>
<td>9,501.30</td>
<td>7,341.58</td>
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<tr>
<td>Daily</td>
<td>2.47</td>
<td>3.13</td>
<td>2.47</td>
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<tr>
<td>Hourly</td>
<td>0.08</td>
<td>0.10</td>
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#### Fuel Use (Therms)

<table>
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<th>Alternatives 3</th>
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<tbody>
<tr>
<td>Annual</td>
<td>18,072.00</td>
<td>23,072.00</td>
<td>18,072.00</td>
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<tr>
<td>Monthly</td>
<td>1,506.00</td>
<td>1,922.67</td>
<td>1,506.00</td>
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<tr>
<td>Daily</td>
<td>0.44</td>
<td>0.53</td>
<td>0.44</td>
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<tr>
<td>Hourly</td>
<td>0.02</td>
<td>0.03</td>
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#### Electricity Costs

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<th>Alternatives 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>$40,940.00</td>
<td>$42,509.00</td>
<td>$42,799.00</td>
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<tr>
<td>Monthly</td>
<td>$3,412.00</td>
<td>$3,542.00</td>
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<tr>
<td>Daily</td>
<td>$0.12</td>
<td>$0.13</td>
<td>$0.12</td>
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<tr>
<td>Hourly</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
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#### Energy Costs

<table>
<thead>
<tr>
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<th>Alternatives 1</th>
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<th>Alternatives 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>$73,999.00</td>
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<td>$74,899.00</td>
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<tr>
<td>Monthly</td>
<td>$6,166.58</td>
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<td>$6,499.00</td>
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<td>Daily</td>
<td>$0.20</td>
<td>$0.22</td>
<td>$0.20</td>
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<tr>
<td>Hourly</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
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#### Fuel Costs

<table>
<thead>
<tr>
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<th>Alternatives 2</th>
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</thead>
<tbody>
<tr>
<td>Annual</td>
<td>$27,032.00</td>
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<td>$27,032.00</td>
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<tr>
<td>Monthly</td>
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<td>$2,333.33</td>
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<tr>
<td>Daily</td>
<td>$0.11</td>
<td>$0.12</td>
<td>$0.11</td>
</tr>
<tr>
<td>Hourly</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
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---

The above table and graphs illustrate the energy usage and cost breakdown for the Quinta-Gamelin Community Center, comparing three different alternatives (1, 2, 3) across various categories such as annual, monthly, daily, and hourly usage and costs. This analysis helps in understanding the energy efficiency and budget implications for each alternative.
Team 9
Design Option 1

Floor plan, section and 3D rendering of Design Option 1.
Team 9
Design Option 2

Floor plan, section and 3D rendering of Design Option 2.
Team 9
Design Option 3

Floor plan, section and 3D rendering of Design Option 3.
Team 9
Final Design

1. Entry
2. Front entrance to community center.
3. Floor plan
1. Pool
2. South and west elevations
3. Grounds and covered path outside the building.
# Team 9
## Square Footage Takeoff

### Initial Program

<table>
<thead>
<tr>
<th>Description</th>
<th>SF</th>
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</thead>
<tbody>
<tr>
<td>Support / Staff</td>
<td>38</td>
</tr>
<tr>
<td>Support Areas</td>
<td>102</td>
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<tr>
<td>Exercise / Equipment</td>
<td>41</td>
</tr>
<tr>
<td>Storage / Offices</td>
<td>163</td>
</tr>
<tr>
<td>Kitchen</td>
<td>192</td>
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<tr>
<td>Total Initial</td>
<td>708</td>
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</table>

### Final Program

<table>
<thead>
<tr>
<th>Description</th>
<th>SF</th>
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</thead>
<tbody>
<tr>
<td>1st floor</td>
<td></td>
</tr>
<tr>
<td>2nd floor</td>
<td></td>
</tr>
<tr>
<td>Total SF</td>
<td>30,437</td>
</tr>
</tbody>
</table>

### Notes
- Square footages for facilities.
- Total initial square footage: 708 square feet.
- Total final square footage: 30,437 square feet.

---

*Quinta-Gamelin Community Center*
Team 9
Cost Analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cost to Owner</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Anonymous Gift</td>
<td>$1,000,000</td>
</tr>
<tr>
<td><strong>Cost Target</strong></td>
<td><strong>$2,500,000</strong></td>
</tr>
<tr>
<td>Designer/Architect Fees (-8%)</td>
<td>$200,000</td>
</tr>
<tr>
<td>Construction Management Fees (-5%)</td>
<td>$125,000</td>
</tr>
<tr>
<td>Bonus Pool (-2%)</td>
<td>$50,000</td>
</tr>
<tr>
<td><strong>Cost Target (materials and hard costs)</strong></td>
<td><strong>$2,125,000</strong></td>
</tr>
<tr>
<td>Rec Center Total Cost</td>
<td></td>
</tr>
<tr>
<td>Two Additions</td>
<td></td>
</tr>
<tr>
<td>MEP</td>
<td></td>
</tr>
<tr>
<td>Interior/Exterior Finishes</td>
<td></td>
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<tr>
<td><strong>Subtotal:</strong></td>
<td><strong>$750,000</strong></td>
</tr>
<tr>
<td>Pool</td>
<td></td>
</tr>
<tr>
<td>Pool Addition</td>
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</tr>
<tr>
<td>Amenities/Pumps and Filtration systems</td>
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</tr>
<tr>
<td>MEP</td>
<td></td>
</tr>
<tr>
<td>Interior/Exterior Finishes</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal:</strong></td>
<td><strong>$1,400,000</strong></td>
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<tr>
<td>Bonus Allocation Removal</td>
<td>$25,000</td>
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<tr>
<td><strong>Grand Total:</strong></td>
<td><strong>$2,150,000</strong></td>
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<tr>
<td><strong>Cost to Client + Anonymous Gift</strong></td>
<td><strong>$2,450,000</strong></td>
</tr>
</tbody>
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