EAST BAY REGIONAL PARK DISTRICT
Jim Devlin, Project Manager
David Edquist, CDG Exhibit Supervisor
Anne Kassebaum, Chief of Interpretive and Recreation Services
David Zuckerman, North/West Regional Interpretive and Recreation Services Manager
Sara Fetterly, Tilden Supervising Naturalist
Anthony Fisher, Naturalist
James Wilson, Naturalist
Lawrence Christensen, Tilden Maintenance Manager
Trent Pearce, Naturalist
Gail Broesder, Naturalist
David Marsh, Park Service Attendant
Kim Spinale, Senior Office Specialist
Mark Hertz, Park Ranger
Stacey Hogan-Batalla, Project Coordinator
Ren Bates, Capital Programs Manager

PROJECT TEAM
Siegel & Strain Architects: Susi Marzuola, Nancy Malone, Lindsey Moder
Interface Engineering: Joel D. Cruz
IDA Structural Associates: Jason Lee
BKF Engineers: Dan Schaefer
John Northmore Roberts & Associates: John Roberts
Margen + Associates: Peter Margen
Robert Borinstein Company: Bob Borinstein
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I. PROJECT STATEMENT

The East Bay Regional Park District (EBRPD) engaged the services of Siegel & Strain Architects and their consultants to investigate whether to renovate or replace the existing Tilden Environmental Education Center (EEC) in the Nature Area of Tilden Regional Park, located at the north end of Central Park Drive in Contra Costa County, California.

This study was initiated with a thorough evaluation of the existing EEC structure to determine its functional and programmatic deficiencies, to study the physical limitations to adaptation, and to determine the level of effort required to rehabilitate the building and bring it up to current building codes. The consultant team prepared an existing conditions report which is included as an appendix to this report.

The consultant team also conducted programming workshops with EBRPD staff to establish project goals, to discuss the limitations of the current building and site, and to establish the wants and needs for the EEC moving forward. The following EBRPD people were involved in the programming workshops:

Jim Devlin, Project Manager, EBRPD
David Edquist, CDG Exhibit Supervisor, EBRPD
Anne Kassebaum, Chief of Interpretive and Recreation Services, EBRPD
David Zuckerman, North/West Regional Interpretive and Recreation Services Manager, EBRPD
Sara Fetterly, Tilden Supervising Naturalist, EBRPD
Anthony Fisher, Naturalist, EBRPD
James Wilson, Naturalist, EBRPD
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Kim Spinale, Senior Office Specialist, EBRPD
Mark Hertz, Park Ranger, EBRPD
Stacey Hogan-Batalla, Project Coordinator, EBRPD
Ren Bates, Capital Programs Manager, EBRPD

The programming effort provided the opportunity to create a shared understanding of the experiential, educational and operational needs and aspirations for the EEC, and it yielded a list of the types of spaces and functions required to support these needs. Discussions centered primarily around site and building access, and the desires to make the EEC more prominent and inviting, to create a stronger connection between the EEC and the adjacent Little Farm, and to integrate the experience of the EEC structure with the surrounding natural resources.

This effort also yielded a set of design goals to guide and evaluate the conceptual plan options prioritized by ranked voting during a workshop with EBRPD staff held on December 8, 2016:

- Provide universal access required to meet Americans with Disabilities Act (ADA)
- Integrate the facility with the site and the Nature Area
- Support the delivery of Park programs and information
- Develop exhibits (indoors and outdoors) that are varied, engaging, inspiring
- Improve functional relationships within the Visitor Center
- Enhance the Nature Area’s inherent characteristics and benefits
- Maximize and demonstrate sustainable design strategies
II. LOCATION & CONTEXT

Since its inception in 1934, the East Bay Regional Park District has provided the much needed opportunity for outdoor exploration and recreation to East Bay communities and residents. The Tilden Nature Area, where the TEEC is sited, began its life as the Civilian Conservation Corps camp in 1934. These lands were kept off limits to the public until 1946, when the area was converted to a Nature Camp, coined a, “…‘Dream Camp’ where children could be taught natural science while enjoying outdoor activities like hiking, swimming and camping.” (Tilden Regional Park, Richard Langs, Park History Press, 2016, p. 107) This portion of the park has had a long history of building amenities and much beloved attractions for the public, including: Little Farm, The Nature Lodge, the Tilden Merry-Go-Round and the Redwood Valley Railway. The Tilden Environmental Education Center, constructed in 1974, is no exception.
III. SITE ANALYSIS

The site for the existing EEC building presents both opportunities and constraints for consideration in the development of a new or rehabilitated visitor center.

The building site is set some distance from the main point of arrival – the existing parking lot south of the EEC which also serves the Little Farm, Indian Camp and access to trail to Jewel Lake and throughout the Nature Area.

From one’s vehicle or bus or other mode of transport, a visitor descends from the parking lot down to a wooden pedestrian bridge over Wildcat Creek. In this passage through the trees and into a more natural setting, the feeling of leaving a vast paved parking lot and entering a nature area is palpable. From the bridge,
visitors can see the EEC above, set in a clearing atop a lawn. However, past the bridge the existing main path directs pedestrians to turn right and head towards Little Farm, a prime destination for many park visitors. Some ways up this path, a smaller path branches off towards the EEC.

A combination of path alignment and architectural design contributes to the EEC being unrecognizable as a public destination. The main pathway to the building feels secondary to that of the Little Farm. The existing building’s main doors are pulled back and away from the crest of the hill, making it difficult to see from the foot of the hill. The building’s tall solid walls and lack of windows contribute to its unrecognizability.

Physical connections between the building and its surroundings are also lacking and strained as a result of this architecture. The hilltop presence, while fortunate for the visibility it provides, also presents accessibility challenges. The large irrigated lawn on the hill is contradictory to the primary environmental stewardship message of the EEC. Additionally, storm drainage around the building does very little to inform the visitors about ecological connections to the built and natural environments.

Moving around the building to the east on the path to Little Farm, a large manure composting yard disrupts a potential continued connection between Little Farm and the glen behind the EEC. On the opposite side, the west side of the EEC, the staff parking lot and entry is highly visible from the Wildcat Creek Trail, presenting an intrusion to the visitor experience of the natural setting. Additionally, the maintenance yard and field pump station located just past the parking lot entry present another intrusion to the trail experience. All of these spaces require access for vehicles, service equipment and delivery trucks, creating a further disruption to the natural setting.

All of these problematic aspects present opportunities and focus for improvements in both the renovation and replacement schemes. Re-orienting the building so that the entrance is visible and welcoming, and the public and exhibit spaces are evident. Designing more intentional pathways at better locations around and between the EEC, the Little Farm and surrounding hiking trails will create a sense of connectivity between these destinations, reinforcing the Nature Area as place in and of itself. Both the main path to Little Farm and the Wildcat Creek Trail can be re-envisioned as more pedestrian friendly components of the natural experience which also happen to be roadways for staff and service vehicles.

IV. EXISTING BUILDING EVALUATION

Siegel & Strain Architects and our consultant team conducted a review of the EEC on September 15, 2016 to evaluate the existing conditions of the building and site. The team’s investigation included: a review of access to the site and buildings and compliance with the Americans with Disabilities Act (ADA); an evaluation of structural, mechanical, plumbing and electrical systems; and a review of the condition of finishes and architectural elements.

The critical deficiencies that require attention in order to renovate the existing center include:

- Creating an accessible path of travel between the raised central rotunda and the lower wings of the building;
- Replacing the outdated and inefficient mechanical and lighting systems;
- Repairing the structural deficiencies of the building; and
- Replacing the exterior envelope as maintenance of the building exterior over time has been minimal.

Water and electric capacity for either a remodeled or new building require further analysis as a next step in the project design process. Existing water service is insufficient for fire suppression. Existing electrical capacity is borderline insufficient. A more efficient electrical system would be installed in a new Visitor Center.
Above: The central rotunda of the TEEC is raised above the level of the surrounding building wings.

Left above: Fire Alarm Power Supply Panel.

Right: Heating & Ventilating Unit. This particular unit was disabled and being used for parts to repair other equipment.
Above: Portions of the north façade exhibit excessive bio-growth.

Right: Exterior wood shakes are extremely weathered.
V. PROGRAM AND FUNCTIONAL NEEDS

In October of 2015, David Edquist, EBRPD CDG Exhibit Supervisor facilitated an initial EBRPD staff visioning workshop as a way to initiate a discussion regarding exhibits at the TEEC. The resulting report (included in the appendix) was provided to Siegel & Strain Architects (S&S) as a starting place for our participatory programming and conceptual design process with EBRPD and EEC staff which featured three in-house EBRPD/TEEC work sessions, summarized below with supporting documentation in the appendix.

The first work session, held on October 04, 2016, gave the EBRPD staff an opportunity to further envision the future of the EEC with specific focus on the values the center should embody; the kinds, types and sizes of spaces necessary to best deliver the ideal EEC program; and the areas and characteristics of the existing building and site that supported and distracted from the EEC experience.

A second workshop on October 26, 2016 involved small groups of staff to further define specific space types and size requirements, and to organize these spaces into building layouts, showing rough space sizes and space adjacencies. The common threads that emerged from the two group efforts indicated that:

- The main lobby must be near the main entry and have a relationship with the Little Farm;
- Public restrooms must be near the main entrance and lobby and need to have both interior and exterior access;
- Staff offices should be near the lobby and exhibits;
- Exhibit and program spaces should have a relationship with, and be visible from, the surrounding outside area.

A third and final workshop on December 08, 2016 provided staff the opportunity to review and rank two potential building schemes – a renovation scheme and a new building scheme. Participants evaluated the pros and cons of each scheme against established project goals and ranked the schemes based on its ability to achieve the project goals. The new building scheme outranked the proposed renovation scheme 856 to 573. Documentation and explanation of the ranking is included in the appendix.

VI. FUNCTIONAL PROGRAM SUMMARY

The primary spaces identified are:

- Lobby: 600 sf
- Exhibit space: 2,900 sf
- (1) Auditorium (or large program space): 1,500 sf
- (1) Indoor program spaces: 1,000 sf
- Staff offices and operational support space: 2,890 sf
- Public restrooms with indoor and exterior access: 600 sf
- Maintenance Shop: 500 sf
- Residence: 1,000 sf
- (3) Outdoor gathering spaces space: 1,800 sf
- Staff parking – 16 vehicles: 5,200 sf
EB PARKS: TILDEN VISITOR CENTER
REMODEL SCHEME
3/28/17, SIEGEL AND STRAIN ARCHITECTS
VII. RENOVATION & NEW BUILDING OPTIONS

OPTION 1 – RENOVATED SCHEME

AREA: 11,980 sf

ESTIMATED PROJECT COSTS

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovated Visitor Center</td>
<td>$5,976,000</td>
</tr>
<tr>
<td>Renovated Residence</td>
<td>220,000</td>
</tr>
<tr>
<td>Utility/ADA Offsite</td>
<td>$1,100,000</td>
</tr>
<tr>
<td><strong>Estimated Hard Construction Costs</strong></td>
<td><strong>$7,296,000</strong></td>
</tr>
<tr>
<td>Owner Direct Cost</td>
<td>$2,340,000</td>
</tr>
<tr>
<td>Soft Project Cost</td>
<td>1,850,000</td>
</tr>
</tbody>
</table>
| **Estimated Project Costs – Total** | **$11,486,000** (Estimate based on Spring 2017 costs and does not include inflation escalation.)

PROJECT DESCRIPTION: A requirement of any renovation scheme is to bring the building into compliance with the Americans with Disabilities Act (ADA) to provide staff and visitors alike with universal access to all areas of the building. To that end and to capitalize on the existing organization of the existing building, the big move proposed in the Renovation Scheme is lowering the finish floor in the central Rotunda to match that of the entry and to bring it within inches of the remainder of the building. The scheme also features a new building entry at the existing Wildcat Canyon exhibit wing welcoming visitors with a prominent projecting porch, large entry doors and windows, creating a direct connection to the adjacent Little Farm and signaling to Park users that the TEEC is a public facility. To accommodate the lowered finished floor elevation, the TEEC’s rear patio is redesigned as an amphitheater, providing a gathering space on the north side of the building which steps up to the existing green at the top (northern) edge of this new amphitheater.

Based on the building evaluation undertaken by Siegel & Strain Architects and our consultant team of structural, mechanical, plumbing and electrical engineers, the building has a number of deficiencies that require significant upgrades or replacement during renovation:

- Seismic upgrade to correct insufficient load resisting capacity in the shear walls and to strengthen the load path from the diaphragm to the foundation. The low roof portions of the building do not appear to have lateral load resisting elements or tie to lateral load resisting elements, conditions which require correction during renovation.
- Plumbing, mechanical, electrical and lighting systems are all beyond their service life and full replacements are required for code compliance, for improved control and comfort, and for significant savings in energy and natural resource usage.
- Building exterior envelope requires extensive replacement of materials including the roofing and flashing, the wood shake siding and trim, the windows and skylights. Additional building insulation is required for energy-code compliance.
- To meet accessibility codes and in conformance with principles of universal access, aspects of the building, such as the fireplace well in the existing story room, require redesign to make them more inviting and welcoming to all.

EVALUATION SUMMARY

PROS
- Keeps existing building, preserving history of site
- Compact solution
- Makes existing building accessible
- Less expensive option

CONS
- Inward-focused building and plan
- Internal adjacencies of building functions not ideal
- Insufficient floor plan will limit the facilities’ flexibility
- Lacks strong connection to the Little Farm and surrounding site
- Potential unknown construction costs with the existing building

EVALUATION RELATIVE TO PROJECT GOALS

At Workshop 2, EBRPD staff evaluation the scheme against the established project goals. Below is a summary of that evaluation:

<table>
<thead>
<tr>
<th>Goal Ranking*</th>
<th>Scheme Pts**</th>
<th>Total***</th>
<th>Project Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.08 22</td>
<td>89.83</td>
<td>Enhance the Nature Area's inherent characteristics and benefits</td>
<td></td>
</tr>
<tr>
<td>5.17 22</td>
<td>113.67</td>
<td>Support the delivery of Park programs and information</td>
<td></td>
</tr>
<tr>
<td>4.50 21</td>
<td>94.50</td>
<td>Develop exhibits (indoors and outdoors) that are varied, engaging and inspiring</td>
<td></td>
</tr>
<tr>
<td>5.50 20</td>
<td>110.00</td>
<td>Integrate the facility with the site and the Nature Area</td>
<td></td>
</tr>
<tr>
<td>4.17 23</td>
<td>95.83</td>
<td>Improve functional relationships within the Visitor Center</td>
<td></td>
</tr>
<tr>
<td>3.33 21</td>
<td>70.00</td>
<td>Maximize and demonstrate sustainable design strategies</td>
<td></td>
</tr>
</tbody>
</table>

**Total Points 573.83 Compared to 856.58 points for the New Building Scheme**

* Workshop 2 participants individually prioritized each goal. The amounts listed in this column represent the average of the rankings.
** On a scale from 1 (low) to 5 (high), Workshop 2 participants individually graded how well they thought the schemes met each project goal. The amounts listed represent the total of all the grades submitted.
***Amounts listed in the Totals column are the product of the Goal Ranking times the Scheme Points. The higher the points, the more successful the scheme is at meeting the goals.
OPTION 2 – NEW BUILDING SCHEME

AREA: 11,980 sf

ESTIMATED PROJECT COSTS

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Center–New Construction</td>
<td>$7,732,000</td>
</tr>
<tr>
<td>Renovated Residence</td>
<td>220,000</td>
</tr>
<tr>
<td>Utility/ADA Offsite</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>Estimated Hard Construction Costs</td>
<td>$9,052,000</td>
</tr>
<tr>
<td>Owner Direct Cost</td>
<td>$2,520,000</td>
</tr>
<tr>
<td>Soft Project Cost</td>
<td>2,120,000</td>
</tr>
</tbody>
</table>

**Estimated Project Costs – Total** $13,692,000 (Estimate based on Spring 2017 costs and does not include inflation escalation.)

PROJECT DESCRIPTION: In the new building option, three new structures create a campus, capturing and shaping outdoor spaces as part of the TEEC and Little Farm experience. The TEEC functions are organized into logical groupings – the main building houses the primary entrance, exhibit hall, public restrooms and administration spaces; an auditorium is in a separate building connected to the main structure with a covered walkway; and a classroom and the shop are located in a third building opposite a central courtyard from the auditorium.

The primary building is sited further south and east than the existing TEEC building, having more of a presence and creating a more visible entrance from the Wildcat Creek bridge. The TEEC entrance is accessed from the same path that leads to the Little Farm, and is marked by a gracious outdoor patio and porch that leads to the lobby. The auditorium building (northeast of the main building) and the classroom/shop building (northwest of the main building) are similar scale as the Little Farm Barn, extending the sense of the TEEC campus to include the Little Farm. The landscaped courtyard between the three new TEEC buildings features a large covered rear patio, a stepped outdoor seating area northeast of the classroom building and views across the green into the wooded area north of the TEEC. This campus approach offers Park users and Little Farm visitors shortcuts through the TEEC and the TEEC courtyard on their ways to trails and Jewel Lake.

EVALUATION SUMMARY

PROS
+ Improved connections to the Little Farm, the natural surroundings and the trail systems
+ Strong indoor/outdoor relationships
+ Visible and inviting entry experience
+ Covered outdoor program areas
+ Campus approach accommodates phased implementation
+ Passive design and new construction accommodate greater energy efficiency in operations
+ New design and construction more readily accommodate for a state-of-the-art Visitor Center facility

CONS
– Office distant from main entry
– Potentially more extensive site work required
– More expensive option

EVALUATION RELATIVE TO PROJECT GOALS

At Workshop 2, EBRPD staff evaluated the scheme against the established project goals. Below is a summary of that evaluation:

<table>
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<th>Scheme Pts**</th>
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<th>Project Goals</th>
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</thead>
<tbody>
<tr>
<td>4.08</td>
<td>33</td>
<td>134.75</td>
<td>Enhance the Nature Area’s inherent characteristics and benefits</td>
</tr>
<tr>
<td>5.17</td>
<td>33</td>
<td>137.50</td>
<td>Support the delivery of Park programs and information</td>
</tr>
<tr>
<td>4.50</td>
<td>33</td>
<td>148.50</td>
<td>Develop exhibits (indoors and outdoors) that are varied, engaging and inspiring</td>
</tr>
<tr>
<td>5.50</td>
<td>34</td>
<td>187.00</td>
<td>Integrate the facility with the site and the Nature Area</td>
</tr>
<tr>
<td>4.17</td>
<td>27</td>
<td>112.50</td>
<td>Improve functional relationships within the Visitor Center</td>
</tr>
<tr>
<td>3.33</td>
<td>31</td>
<td>103.33</td>
<td>Maximize and demonstrate sustainable design strategies</td>
</tr>
</tbody>
</table>

**Total Points** 856.58 Compared to 573.83 points for the Renovation Scheme

* Workshop 2 participants individually prioritized each goal. The amounts listed in this column represent the average of the rankings.
** On a scale from 1 (low grade) to 5 (high grade), Workshop 2 participants individually graded how well they thought the schemes met each project goal. The amounts listed represent the total of all the grades submitted.
*** Amounts listed in the Total column are the product of the Goal Ranking times the Scheme Points. The higher the points, the more successful the scheme is at meeting the goals.
VIII. RECOMMENDATION

Based on careful analysis and review of the two options with EBRPD staff, Siegel & Strain Architects recommend that the existing TEEC structure be removed and replaced with a new collection of structures. Our analysis indicates the existing building is both functionally and programmatically deficient. A new Environmental Education Center will be more capable of meeting the needs defined by EBRPD staff, and has more potential to create a holistic and cohesive visitor experience within the Tilden Nature Area.

RECOMMENDATION BASIS
This recommendation is based on the findings of the programming workshops held with EBRPD staff which focused on program needs grounded in the mission of the Tilden Environmental Education Center and the Tilden Nature Area. At the workshops, each scheme was evaluated against a set of project goals, created by participating Tilden Environmental Education Center and EBRPD staff, listed below, which were ranked and weighted according to priority.

<table>
<thead>
<tr>
<th>Schm Pts</th>
<th>Goal Ranking</th>
<th>Total Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.50</td>
<td>Enhance the Nature Area’s inherent characteristics and benefits</td>
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<td>Support the delivery of Park programs and information</td>
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<td>4.17</td>
<td>Improve functional relationships within the Visitor Center</td>
<td></td>
</tr>
<tr>
<td>3.33</td>
<td>Maximize and demonstrate sustainable design strategies</td>
<td></td>
</tr>
</tbody>
</table>

Priority 1=7 points; 2=6 points; 3=5 points; 4=4 points; 5=3 points; 6=2 points.

The two schemes were then evaluated against each of the goals on a scale from 1 to 5 with 5 indicating good alignment with the goal. The results indicate that the current EEC structure does not meet the experiential, educational and operational needs of EEC visitors and staff, and that a more open and campus like configuration of the center does.

Scheme Ranking

**Renovation Scheme**

<table>
<thead>
<tr>
<th>Schm Pts</th>
<th>Goal Ranking</th>
<th>Total Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>4.08</td>
<td>89.83</td>
</tr>
<tr>
<td>22</td>
<td>5.17</td>
<td>113.67</td>
</tr>
<tr>
<td>21</td>
<td>4.50</td>
<td>94.50</td>
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<tr>
<td>20</td>
<td>5.50</td>
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</tr>
<tr>
<td>21</td>
<td>3.33</td>
<td>70.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>573.83</strong></td>
<td></td>
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</tbody>
</table>

**New Building Scheme**

<table>
<thead>
<tr>
<th>Schm Pts</th>
<th>Goal Ranking</th>
<th>Total Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>856.58</strong></td>
<td></td>
</tr>
</tbody>
</table>
ANALYSIS SUMMARY
The main priority identified by EEC staff for the future of the facility is the integration between the EEC and the greater Tilden Nature Area. This goal is a direct result of the sense of disconnection that the staff feel from their surroundings in the existing EEC. Connection to the Nature Area is of primary importance for them, as programs for the Center are provided in many locations within the Nature Area and are located in all directions from the EEC. To function as the primary gathering space for all of the Nature Area, the EEC must have a significant presence on the site, be easily accessed from any point, and provide flexible, varied spaces for visitors and staff.

The existing EEC is circular in shape with long spans of windowless walls that literally hide other site elements from the center. The building layout creates an internally-focused environment which fundamentally lacks meaningful connection to the surrounding environment. Additionally, the existing EEC is sited atop of a hill. The building is pulled back from the crest, with the main entry located under a covered patio making it difficult for visitors approaching from bottom of the hill to see the EEC and to understand its purpose. Renovation could certainly improve visibility of the front door and some of the interior spaces, but the underlying siting, grading, inward focus and organization of the building are difficult to change.

The campus approach proposed in the replacement scheme better accommodates the desire to embed the center to its site and connect to surrounding amenities. The new center could be designed to visibly link the building interior to its site, to invite visitors in and enhance their experience by grounding it in the larger place and grounds. Exhibit spaces, classrooms, and the auditorium could have better visibility and connection with the surrounding environment. By separating the required spaces into multiple buildings and linking them with a covered patios and walkways, the relationship between the EEC and the surrounding natural resources can be more dynamic and more central to the visitor experience. In a new scheme, visitors could choose any number of paths to and through the Center, where they are currently forced to skirt around the existing building. A new scheme opens the possibility for direct access and visual connection between the Center, the Little Farm, the Jewel Lake Trail and hiking trails from the glade to the north.

The second and third highest ranking goals – supporting the delivery of Park programs and information; and developing exhibits (indoor and outdoor) that are varied engaging, and inspiring – both center around program and exhibit development. Currently, the EEC staff is limited in their capacity to deliver programs in the existing space, primarily due to the space configuration. The building’s radial layout and changes in grade divides the building into separate wings that have little to no overlap or interconnection. These wings each act as singular entities and best serve functions that require single-group use (classrooms, auditorium, office etc.), and not functions that require use by multiple groups at once (exhibits, restrooms and lobby). Similarly, the wings are all similar in size and feeling. They do not lend themselves to providing different visitors’ experiences. The distinct separation of the radial wings also limits the interaction between spaces. Passage through the building is funneled in one direction, and all circulation between spaces is through the central rotunda, making it difficult to serve multiple groups at once. Opportunity for outdoor exhibits is also limited with the only one pathway to the building. While renovation to the existing EEC as proposed could create a more visible and inviting entry and better interconnection between the center’s spaces, opportunities to improve the circulation flow to and through the building remain constrained.

Alternatively, the campus approach of the proposed EEC could provide the opportunity for multiple spaces to be used at once without conflict. Portions of the building could be “closed” while others are in use. Spaces could be provided in varying locations, configurations, and with access to views and daylight, and thus providing for more varied use types and visitor experiences within the center. Multiple building entrances, covered walkways, more intentionally placed views to the site, and a central courtyard scheme could offer multiple locations for exhibits and interpretation.

CONCLUSION
Although the option to build a new EEC is more expensive, the benefits gained from a new building to the overall visitor experience is well worth the investment. While the renovation is less expensive conceptually and on paper, it is difficult to anticipate the costs associated with unforeseen existing conditions that are inevitably found during renovation which could very well lead to a higher than anticipated construction cost. A new EEC has much greater potential than a renovated existing building to act as a broader visitor center for Tilden Regional Park and firmly ground it as a regional destination.
October 2015

Environmental Education Center
Interpretive Workshop Report

"Given that people willfully protect only those things they know and value, visitor centers can make an important contribution to sustainable conservation of our natural and cultural heritage."

Prepared by:
EBRPD Public Affairs
Creative Design Group
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EEC Workshop Report Summary

On September 3, 2015 an interpretive workshop, facilitated by Public Affairs - Creative Design Group was held at Tilden Nature Area. Participants from both Interpretation & Recreation and Public Affairs came together in the first step of a process to revitalize the Environmental Education Center and its grounds. This report summarizes the results of that workshop, draws conclusions and suggests next steps, including an architectural assessment and conceptual plan for a new or revised EEC.

The workshop allowed interpretive staff to begin thinking about the complete story at Tilden; what does the District want to teach and how do the interpretive staff use, and hope to use, the EEC and the surrounding site. We started with a birds-eye view of Tilden including a review of current visitor use and programming emphasis. We drilled down to a review of critical messages, goals and topics that are important District wide and unique to Tilden Nature Area and the EEC.

Participants that participated in the interpretive workshop included:

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Ira Bletz</td>
<td>Regional I&amp;R Manager</td>
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<tr>
<td>Gail Broesder</td>
<td>TNA Acting Supervising Naturalist</td>
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<tr>
<td>Lawrence Christensen</td>
<td>TNA Buildings and Grounds</td>
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<tr>
<td>David Edquist*</td>
<td>Public Affairs CDG Exhibits Supervisor</td>
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<tr>
<td>Anthony Fisher</td>
<td>TNA Naturalist</td>
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<tr>
<td>James Frank</td>
<td>Mobile Supervising Naturalist</td>
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<tr>
<td>Jonathon Hobbs</td>
<td>Public Affairs CDG Manager</td>
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<tr>
<td>Carolyn Jones</td>
<td>Public Affairs P&amp;I Supervisor</td>
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<tr>
<td>Anne Kassebaum</td>
<td>I&amp;R Chief</td>
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<tr>
<td>Rick Kitamata*</td>
<td>Public Affairs CDG Exhibit Design</td>
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<tr>
<td>David Marsh</td>
<td>TNA Acting Naturalist Aide</td>
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<tr>
<td>Michael Moran</td>
<td>BBVC Supervising Naturalist</td>
</tr>
<tr>
<td>Sharol Nelson-Embry</td>
<td>CC Supervising Naturalist</td>
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<tr>
<td>Trent Pearce</td>
<td>TNA Naturalist</td>
</tr>
<tr>
<td>Hillary Van Austen</td>
<td>Public Affairs CDG Graphic Design</td>
</tr>
<tr>
<td>James Wilson*</td>
<td>TNA Naturalist</td>
</tr>
<tr>
<td>Dave Zuckermann</td>
<td>Regional I&amp;R Manager</td>
</tr>
</tbody>
</table>

* Facilitators
Workshop Agenda

9:00 Purpose and Introductions - DE
What is an interpretive workshop?
What makes a visitor center successful?
Favorite Exhibit or Visitor Center Exercise

9:45 Primary Interpretive Goals and Themes - JW
Restate, refine, or confirm primary interpretive goals and targeted themes for the ECC.
What do we want the visitor to leave with?

10:45 Break

11:00 Visitor Profiles - JW
Who uses the EEC and Tilden? What cultures, age groups, language groups and learning concerns do they have? Consider accessibility issues. Who is this for? Who is underserved?

11:30 Brainstorming Content (Topics) - DE
Under each previously identified interpretive theme; list stories, topics and critical content that should be covered in the exhibits and programs. Review unique features about The Tilden Nature Area. Questions: What is it about? What’s your point of view?

12:30 Lunch

1:00 Prioritizing Content - Attendees
Participants will be asked to prioritize proposed themes, interpretive stories and resources as to their importance and how they best meet previously identified goals.

1:15 Spaces & Uses Review - DE
What kind of spaces and uses make up the EEC? Review traditional spaces and imagine non-traditional spaces included or to be included in the EEC and on its site.

1:30 Brainstorming Resources and Exhibit Techniques - DE
Under the newly prioritized list, objects, devices, props, artifacts and photographs either in the parks collection, or to be acquired, are imagined. What does it look like? How can this subject be best exhibited?

2:15 Break
2:30  Visitor Experience Exercise - DE
Participants will imagine a desired overall visitor experience, organize interpretive themes, spaces and uses, visitor flow, and other factors. Participants will describe their solutions with bubble diagrams, annotations, and other visual means.

How is it organized? Where would you put an emphasis?

3:00  Presentations - Each group will identify a spokesperson to present their visitor experience ideas.

3:30  Conclusion
Favorite Exhibit Exercise

Participants were asked to describe their favorite exhibit and what made it so. Reasons common among the responses included the interactivity, the inspiration or awe, and the unique perspective exhibits offered.

1. Smithsonian History Exhibit, Washington DC - “A Nation of Nations” exhibit forces a visitor confrontation with “Colored vs. White” doorways creating a brief “a-ha” moment of hesitation and concern.

2. Burney Falls Visitor Center, California - Artifact drawers beneath a particular animal showed differences in egg shapes and color, skull shapes and size etc. Interactive and simple. Easy for children to interact with.

3. Turtle Bay Visitor Center - “Packing for a Gold Mining Trip” exhibit offered a choices and decisions game on making the journey and understanding the complexity of it. Excellent temporary exhibits.

4. Lovelock Cave, Nevada - A sense of isolation in a unique landscape.

5. Monterey Bay Aquarium, California - Plankton exhibit and touchable specimens came to life.

6. Space Needle, Seattle - Large interactive touch screen allowed visitors to explore places in the Northwest and the view from the Needle. Addition features included a digital survey, which showed where visitors had come from across the nation and the globe.

7. Stanford Art Museum, California - Then and Now photographic exhibit on touch screen device.

8. Blackhawk Museum, California - Temporary western expansion exhibit with accurate historic artifacts such as a fully outfitted covered wagon. An interactive carnival wheel, projected your chances of surviving the trip to California.

9. Wild Center, New York State - Animal displays including a view under a pond, a perspective you wouldn’t normally have.

10. Viking Ship Museum, Denmark - Viking boat with metal armature supporting actual remains, is silhouetted in front of a fjord. Very minimal interpretation and view created an inspirational exhibit.

11. Peabody Museum, Massachusetts - Sea turtle mounted on a wall dripping oil into a glass vile expressed in a simple manner the reason for hunting the creature.

12. Experience Music Project, Seattle - Interactive make your own music exhibits allowed visitors to go into soundproof rooms to play and record their own music.
13. Dept. of Natural Resources, Detroit - A variety of natural history exhibits, dioramas, play structures and interpretation expressed the breath of the park experiences available. Particularly enjoyable on a cold winter day.

14. Museum of Natural History, New York - Running wolf diorama was so well crafted and lit that it caused a primal response in visitors. Run!

15. Holocaust Museum, Washington DC – A sensory experience, created by the architecture, i.e. false perspective and narrowing hallways leading ultimately to confinement and imprisonment. Building Architecture and exhibit experience working in unison.

16. Fish Hatcheries, California – Amazement and the confining concrete troughs.

17. Lindsay Wildlife Center, California – Spire with collection of animals and plants native to the East Bay.

18. Franklin Institute, Philadelphia – Walking through the inside of a human heart. Sound light and color gave the visitor a dramatic immersive experience.

19. Weaverville, California – the story of a double murder with the clothing and personal artifacts the participants had. Dramatically portrayed with minimal copy.
Visitor Center Success Factors

At the outset of the workshop we review factors that make visitor centers successful. From a document entitled *Learning and Having Fun: Visitor Centers Imparting Knowledge Using a New Format -- Experience from the World Heritage Site Visitor Center in Regensburg, Germany*, we discussed what they considered to be important factors critical to the success of visitor centers worldwide. They include:

Access is Critical
- Easily Accessible to All Visitors
- Sight and Hearing Accessibility
- Adjacent or Within a Cultural or Natural Site

Learning Options Based in Science
- Multi-Cultural Messages
- Less is More – Layering Data
- Interactivity Increases Retention

Vary Methods and Media
- Avoid Similarities in Media and Scale
- Make Content Changeable
- Stimulate Curiosity

Offering a Wide Range of Activities
- Provide Spaces to Gather
- Discovery-Based Learning
- Orientation to Resource and Programs

Special Events and Exhibits
- Temporary Exhibitions
- New and Underserved Target Groups
- Thematically Consistent with Center

Evaluate and Adapt Content
- Be Aware of Changes in Visitor Behavior
- Investigate New and Changing Technology
- New Languages for Changing Demographics
- Allow for New Science and Discoveries

Foster Stewardship
- Make it Memorable
- Create the WOW Factor
- Make it Personal
Interpretive Goals and Themes

Participants were asked to restate, refine, or confirm primary interpretive goals and targeted themes for the ECC. The workshop explored what they wanted the visitor to leave the EEC with?

Initial interpretive goals and themes suggested at the outset of group discussions included:

Goals for the Environmental Education Center
- Act as a primary Visitor Center for Tilden Regional Park.
- Serve as a primary venue for District and community interpretive programming and activities.
- Be viewed as a regional and national destination.
- Better show the connection between urban and natural environments.
- Better convey an understanding of ecology, especially at basic levels for young children.
- Encourage personal connection to nature and get people outside and enjoying and appreciating their parks.

Primary themes at the EEC
- Everyone has a watershed; connections between local habitats and human communities. *Suggested: Everyone lives in a watershed.*
- EBRPD has a long and rich history that started with the Tilden Nature Area.
- The interconnectedness of nature shown through the study of ecology.
- Everyone can be a naturalist: different ways of looking at and studying nature — through all the senses, from large-scale to microscopic, from poetry and art to scientific surveys.

Discussions included a mix of goals and themes
A. Understanding the history of East Bay Regional Park District. Tilden was the created at the start of the District.
   a. The impact of EBRPD's creation on the environment.
   b. Each visitor center in the District acts as a gateway to the rest of the District.
      *Give the visitor a “tool kit” to get outside with. Explore the Park.*
B. What is stewardship
   a. Create an understanding of human impact on the environment
C. Farming
   a. The history of farming at Tilden – located at the farm or at the EEC?
   b. Ranching – Spanish history
   c. The creation of the little farm in 1955
   d. The farm is a separate exhibit from the EEC
   e. How are the farm and the EEC connected in content?
      *Why is there a farm, a merry-go-round and a train in Tilden.*
D. Watershed
E. Nature on the Urban Edge
F. The Naturalist Experience
G. Recreational Opportunities
   a. Consider this as a recreational opportunity for the entire Bay Area.

H. Orientation to the entire EBRPD and all its Parks
I. Why here?
   a. Because of the Creek?
   b. Because of the proximity to Berkeley and other East Bay cities?
   c. Because it was available land in the early 30s?
Visitor Profiles

James Wilson lead a discussion and past visitation profiles and new trends in visitation. Who uses the EEC and Tilden? What age groups, cultures, language groups, and learning concerns do they have? Who are we missing?

Tilden Naturalist School Programs from 2014-2015

Schools Visiting the Tilden Nature Area EEC 2015-2014
Regional in Nature and School Programs at the EEC - 2012 Attendance

Discussions concerning types of groups that visit the ECC
1. Open houses
2. May day celebrations
3. Pond studies represent the largest effort in programming.
4. Public movie nights
5. Birthday parties – primarily in the picnic area
6. Organized hiking groups include university students and adults
7. Organized birding group walks
8. The community based nature program is the oldest group using the EEC.

Discussions on parking and average length of stay
1. Parking issues are significant at the EEC.
2. Shuttles to other lots have been discussed before and not implemented.
3. On weekdays the average hiker might stay 10 minutes in the EEC.
4. On weekdays the average visitor might stay 20 minutes in the EEC.
5. On a weekend the average stay in the EEC may be 1 to 2 hours.

Discussions on making the EEC and VC known to visitors at Tilden
1. How do we draw visitors to the EEC from around Tilden?
2. How do people visiting throughout Tilden know there is a visitor center here?
3. The name Environmental Education Center does not sound welcoming to visitors.
4. The building as is, is uninviting.
5. An effort to market or sign the Visitor Center throughout Tilden would help.
6. There is a need to draw attention to the visitors in the Farm.
7. An entry portal or arch that could identify both the Farm and VC would help.
8. Wayfinding from the parking lot and at the bridge would be helpful.
9. A themed playground located between the Farm and EEC would be helpful.

Discussions on underserved visitors
1. High School students are underserved at the current EEC in exhibits and programming.
2. The primary weekend visitor is an older (30 years plus) and well educated.
3. Layered data in exhibits could serve a variety of age groups simultaneously.
4. Programming for adults should be reviewed.

It was pointed out the demographic information on race, languages and ethnicity was not presented in the background material for our discussion. Discussion of multiple languages in exhibits and signage was deferred.
Brainstorming Content

Participants were asked to list stories, topics and critical content that should be covered in the exhibits and programs and review the unique features of Tilden Nature Area.

Proposed sample topics for the Tilden Nature Area and the EEC included:

- History of Jewel Lake
- Salamanders at Tilden
- Eucalyptus Trees
- Wildcat Creek and Laurel Creek
- Seasonal Birds at Tilden

Topics were discussed in detail. Later in the day each attendee was given eight votes. They were asked to prioritize proposed topics, interpretive stories and resources as to their importance at the EEC and how they best meet previously identified goals and themes. As topics were often similar votes were later combined and topics were joined and renamed in Brainstorming and Exhibit Techniques.

<table>
<thead>
<tr>
<th>Votes</th>
<th>Topics</th>
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<tr>
<td>8</td>
<td>1. The naturalist desk - staffed and self-guided options</td>
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<td>2. What jobs exist at the parks? – an exploration of the parks diverse needs and purposes</td>
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<td>3. Everyone can be a naturalist</td>
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<td>4. Bring in objects and specimens for identification</td>
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<td>5. Junior Ranger programs</td>
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<td>6. The geology of Tilden</td>
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<td>6</td>
<td>7. Tilden salamander story</td>
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<td>3</td>
<td>8. An orientation to Tilden – a portal to the outdoors</td>
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<td>9. Seasonal changing exhibits and programs – temporary exhibits</td>
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<td>10. Death of a lake</td>
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<td>5</td>
<td>11. The Sacramento Perch</td>
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<td>12. The visitor center as a microscope</td>
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<tr>
<td>3</td>
<td>13. Pond studies – Jewel Lake</td>
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<td>5</td>
<td>14. Watershed – as an ecosystem – the story behind Jewel Lake</td>
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<td>3</td>
<td>15. CCC Conservation Camp</td>
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<td>16. EBRPD history and development over time</td>
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<td>17. Orientation to Tilden</td>
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<td>18. Urban wildlife</td>
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<td>19. Urban interface and stewardship</td>
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<td>6</td>
<td>20. The Park at night</td>
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<td>21. Origins of interpretation and founding EBRPD interpreters</td>
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<td>22. Views from Tilden</td>
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<td>23. Tilden then and now</td>
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<td>2</td>
<td>24. What is growing here?</td>
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<tr>
<td>7</td>
<td>25. Climate change</td>
</tr>
<tr>
<td>0</td>
<td>26. What is a scientist?</td>
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</table>
27. Successional change and managing the land
28. Edges
29. Indicator species
30. Rainbow Trout
31. Creeks, lakes and the water story
32. Migration stories
33. Native American stories
34. Urban interface and stewardship
35. What is the EBRPD and where are the surrounding Parks?
36. Weather and the rain beetle
37. What is underground?
38. Insects, bugs and spiders
39. Otters (plus 40 other unaccounted for votes)
Spaces and Uses Review

David Edquist prepared an initial list of visitor center spaces for review. Participants were asked to review that list and make additions or comments.

Spaces by function
   a. Welcome / Introduction / Orientation
   b. Exhibits Interior
   c. Exhibits Exterior
   d. Amphitheater Exterior
   e. Laboratory
   f. Auditorium / Theater
   g. Classrooms (2)
   h. Restrooms
   i. Offices / Conference
   j. Storage
   k. Kitchen
   l. Store/ Gift Shop

Additional spaces desired included:
   a. Utilities Space / Storage
   b. Maintenance / Shop
   c. Deliveries
   d. Animal Displays Life Support / Storage
   e. Meeting Spaces (various sizes interior and exterior)
   f. Mud Room (or mud and wet clothes control)

Spaces by attribute
   a. Views of Tilden Nature Area
   b. Contemplative Space
   c. Inspirational Space
   d. Sustainable Facilities and Materials
   e. Noise and Sound Control
   f. Wet and Dry Activities / Indoor and Outdoor
   g. Bright and Well Lit Spaces

Additional features or attributes considered were:
   a. Roof Top Views
   b. Green Roof
   c. Transition and view outside to inside
Brainstorming Resources, Exhibits and Techniques

After participants voted on the most important topics to be interpreted at Tilden and closely associated topics were combined, those that received the most votes were investigated further. Interpretive techniques, media and methods were explored in detail.

Wildlife on the Edge
a. Remote wildlife cameras
b. A game that allows the visitor to see through an animal’s eyes and become the animal, costumes, goggles etc.
c. The park at night – infrared images - video
d. How can you tell that animals have been there, traces and revealing clues - models
e. Signature birds from Tilden - models and significance
f. Tracking animals, GPS – video or digital access

History of East Bay Regional Park District
a. Images of “then and now” stills on digital media
b. Historic satellite images over time
c. An interactive map that shows Park District expansion over time
d. CCC camp experience – immersive exhibit
e. What would Tilden look like today if the Park had not been set aside – animation, models
f. The people who started the EBRPD – biographies, images, artifacts, quotes
g. Changing over time - geological transformations in Bay Area – animation theater

Everyone is a Naturalist
a. The naturalists desk – self guided and staffed when possible – artifacts, props, audio, changeable data – events of the day
b. Microscopes - ideas about scale – You under the microscope
c. More tactile touching stations – changeable specimens
d. How to use your senses in discovery – how to see, how to listen
e. Historical and current naturalists in the Bay Area (photographic RFID)
f. A place to log your activities in the Park and have them shared and displayed (Facebook)
g. How I became a naturalist – activities, schooling, different career paths

Indicator Species
a. Salamander – models and significance
b. Wilson Warblers – models and significance
c. Wood Rat – models and significance
d. Sacramento Perch – models and significance
e. Rain Beetle – story of lifecycle (media TBD)
f. Turkeys – models and significance
g. The unintended consequences of human influence
h. Interdependency of species and environment
Jewel Lake Story
   a. One square meter of water (mud) – what is in it, on it and above it - model
   b. A drawer in the bank of lake or creek to expose what lives there – tactile model
   c. The engineering story at Jewel Lake – artifacts, models, history
   d. Silt movement at Jewel Lake – exterior exhibit

Climate Change
   a. A scale that shows carbon levels based personal choices - interactive
   b. What would Tilden look like if the average temp rose 3 degrees, 6 degrees
   c. Phenology exhibit – consequences and interdependency - interactive

Insects and Spiders
   a. Large scale model – “honey I shrunk the kids”
   b. Numbers and population of insects at Tilden with comparisons to other known
      numbers i.e. school populations or population of humans in Bay Area
   c. Rain Beetle story - model and significance, video
   d. Calistoga Spider story - model and significance, video
   e. Sphinx Moth story - model and significance, video
   f. Collections of specimens – traditional drawers and vertical displays
   g. Life cycle game
   h. What insects see
   i. What good are insects anyway
   j. Live observation

Stewardship
   a. Use stewardship as a thread through all exhibits
   b. What can I do – list of activities to participate in and places to learn
   c. A day in the life of a good steward
   d. Why should I care
   e. What we should not do
   f. Sustainability – EEC as a model

Where am I and what can I do here?
   a. Trip planning exhibits – self guided and staffed – mechanical or digital
   b. Other Parks and places to go (a district interactive)
   c. Information at parking lot, in a plaza and in the welcome area of EEC (media varies)
   d. A welcome desk that is separate from retail
   e. Application for smart phone – easily available
Visitor Experience Exercise

With this final segment in the workshop the participants were divided into three groups to diagram a preferred visitor experience; visitor flow, thematic relationships, staff and infrastructure needs and relationship to the adjacent Little Farm were addressed. Several sample diagrams (shown below) were reviewed and participants had the option to overlay their diagrams on top of the current EEC footprint or not. One group chose to create both a current footprint experience and all groups prepared a free flow organization independent of the current EEC structure.

Sample Visitor Experiences
Group One Visitor Experience

Entrance adjacent to Little Farm
Exterior Exhibits
Entrance Associated with bathrooms, gift shop, orientation and naturalist desk
Central Jewel Lake experience
History area
Insect exhibits
Indicator species exhibits
Lab next to classroom with exit
Separate auditorium with adjacent staff and shop
Group Two Visitor Experience

Arrival orientation at circle
Gateway experience with interpretation
Exterior art
Welcome plaza near new play area
Naturaist desk and Park info introductory exhibits
Central exhibits area with kid’s section
Classrooms bisected by lab
Café
Exterior amphitheater
Exterior Jewel Lake exhibit
Visitor entrance adjacent to Little Farm and play area
Restrooms with exterior access
Classroom, lab and meeting area with separate entrance
"Where am I?" welcome exhibit
Exhibits central to plan
Access to green roof and view “orientation” platform from exhibits
Amphitheater adjacent to exhibits and office space
Exterior playground
Entrance revision
Bathroom facing exterior
Exhibit area combination of current galleries and current entrance
Exterior stream interpretive feature
Store relocated to fire well
Classroom lab with exterior glass wall open to farm
More office space
Green roof access
Exterior amphitheater
Workshop Conclusions

Several major conclusions can be drawn from the workshop collaboration. These were repeated often in the discussions that unfolded as the workshop progressed. We consider this an initial list of interpretive requirements and design criteria that future planning must address with specific solutions.

A. The EEC as a visitor center should not only introduce and orient visitors to the Tilden Nature Area and Tilden Regional Park but act as a gateway to the other EBRPD sites and resources.

B. Sustainability is a critical topic to interpret, and physically the EEC can be a model for sustainability in the District.

C. The EEC is not currently an inviting facility, and many visitors to the farm do not visit or are unaware it is a visitor center. We recommend opening the EEC up to the site, creating exterior playground and exhibit features and refurbishing or creating new facilities to accept contemporary interpretive media and methods.

D. Accessibility for all individuals and groups is critical. The EEC and its exhibits do not meet current standards.

E. Significant interpretation on the history of EBRPD is ideally located in the EEC as Tilden is one of the original Parks of the district.

G. One primary theme that was revisited several times in the workshop was the notion of a natural environment on the edge of an urban environment and the symbiotic interplay between those two worlds. Expressing this in exhibits and programs can be a primary objective at the EEC.

H. The concept that “Everyone is a Naturalist” is a theme that was repeated often throughout our discussions. Expressing this in exhibits and programs can be a primary objective at the EEC.

I. Jewel Lake remains an important focus for exhibit interpretation and educational programming.

J. Stewardship of this Park, the District, and the environment in general must be a primary topic in all interpretive efforts including, programming, recreation and interpretive exhibits.
Preliminary ECC Interpretive Design

Sample images from selected visitors center facilities and exhibits.

McArthur–Burney Falls Memorial State Park
Visitor Center, Arches National Park
Mercer Slough Environmental Education Center, Bellevue Washington
Natural History Exhibit Interactive, Los Angeles Natural History Museum
Moose Visitor Center, Grand Teton National Park
Next Steps

The process that this workshop initiated includes several phases:

**Interpretive Workshop** (completed)
- Goals and Themes for the EEC
- Topics and Stories Critical to the EEC
- Resources and Media at the EEC
- Preliminary Visitor Experience at the EEC
- Draft Report on Findings
- Interpretive Conclusions
- Preliminary Interpretive Concepts
- Interpretive Report

**Facilities Assessment and Conceptual Design** (proposed)
- EEC Architectural and Engineering Assessment
- Architectural and Site Conceptual Options
- Exhibit and Interpretive Concepts
- Budget and Schedule Recommendations
- Planning Report

The District could benefit from a physical assessment of the EEC and site. With the interpretive assessment now in hand this study would help answer the following questions:

- What is the current architectural state of the EEC?
- What can be done to the facility to make it more sustainable and energy efficient?
- Can the EEC be altered to meet interpretive, programmatic and recreational goals?
- What is the cost for maintaining the current EEC?
- Would it benefit EBRPD to create a new EEC visitor center?
- What might it look like?
- What might it cost?

We suggest that a study be undertaken to answer these questions. We also recommend that we select an architect with significant experience in the design of visitor and environmental education centers for public agencies. CDG staff has experience in working with several well-recognized visitor center architects. With architectural and interpretive alternatives in hand the District would be well positioned to make decisions about the short and long term opportunities at the Environmental Education Center in the Tilden Nature Area.
1. In general, what do you love and value about the Tilden Park – the place and the experience it offers?

Unique blend of wildness and developed recreation
- Close to the city/urban
- Accessible, Free (no fee)
- Multiple adjacencies
- History – where EBRPD began
- Diversity of Experiences
- Sacred and set-aside
- Open space – no houses
- Contrast of ridges and valleys
- Hiking the trails. Looking for animals.
- Exploring the area.
- Inspiration Trail
- Leading Kids around and sharing wonders.
- Loved as a kid, love sharing with kids.
- Wildlife
- Farm Camp

2. Zooming in, what do you love and value about the Tilden Nature Area – the place and the experience it offers?

- Free (no fee)
- Little Farm
- Jewel Lake Boardwalk
- Junior Ranger Lodge
- Nature near city – educational resources
- Opportunities for engagement
- Set aside for nature study
- Variety of habitats
- High concentration of big, cool stuff
- Fewer bikes, no dogs
- Dead end
- Fresh water resource & experience. Water is accessible.
- Wetlands experience
  - accessible
  - controlled access
  - immerse in experience
- History of District – CCC camp right here, junior ranger lodge was original CCC camp. Many features of park made by CCC work program.
- History of area: little farm showing historic land use of valleys & hills
3. More Specifically, what do you love or value about the TEEC – the experience, not the building necessarily, but the experience it offers?
   - Welcoming staff – great staff
   - Hub for school programs
   - Face of District – engages people.
   - Beginning or closing point to park experience:
     - contact
     - link to places and experiences
     - info center
   - Can serve for special events
   - Exhibits give experience you can’t have outside.
   - Separate: arrive at a different place.
   - Deeper knowledge of the place
   - Focal point for gathering
   - View is up and outdoors. Nice impression of open & wild.
   - Nature ethic is all around. There is a space set aside for nature study.
   - Wooden cat: touch, feel, climb, sit, photo-op. Interactive.
   - Location: near wetlands & farm

4. What groups and individuals, in your opinion, need to be accommodated in the TEEC?
   Seniors, Adults (parents, thirtysomethings or older), Adults (twentysomethings), Kids (Teens, Tweens, Elementary, Preschoolers, Toddlers, Wobblers)
   All of the above or any group in particular?
   - Accommodate all of the above.
   - Encourage all ages to intersect in different ways.
   - Accommodate groups larger than a school group.
   - Current users are young kids and retired, accommodate the gap – HS kids and UCB science students.

5. What potentially, in your opinion, will attract new users to the TEEC?
   - More engaging stuff inside.
   - Better exhibits, Travelling/changing exhibits, Interactive exhibits
   - Area specifically for tots built-in permanently to exhibits
   - Place for adults to chill, watch film (as at big break)
   - Hands-on exhibit for all ages (older youth & adults): multi-media, physical, mechanical, tactile, digital
   - Improve classrooms and programs to reach older kids & young adults.
   - Rental facilities generating income (wedding, conference, private events)
   - Gimmick that attracts users: sell celery, coffee, wifi?
   - Change name to Visitor’s Center: EEC does not say that you are welcome
   - More welcoming entry & building aesthetic. See inside the building and see people in the building.
   - Better connection to little farm. Arrival sequence joined with farm.
   - Public aesthetic: character, human scale.
   - Daylit, open, connect with views
   - Better signage, website, provide actual address
6. Dream a little bit. Jot down some notes, a list or a brief paragraph to respond to the following:

A. Imagine that you have just arrived at the Tilden Nature Area on a Saturday and are stepping off the bus or out of your car, or parking your bicycle. Describe the arrival experience from this point and through the front door of the new Tilden Visitor Center.

- Parking lot circle improved – it gets blocked
- Clear wayfinding at arrival and through arrival sequence.
  - Big map of Tilden with info about hikes
  - Signage/greeting with schedule of events and interpretive info.
- Let people know they have arrived.
- Easy path to the VC: aim for the VC first, then branch off to the Little Farm.
- Unique VC building, different than the farm.
- Building is part of landscape (not an object)
- A non-building space frames around the natural environment (deconstruction of building)
- Outdoor spaces that work with building and show how they connect.
- Pond at back lawn
- Easy gathering spaces, accommodate multiple groups
- A place to sit outside in front of center for lunch and snack
- Large, welcoming patio entry: visual connection to Little Farm, with exhibits, sculpture, art.
- Sculptural elements inside and outside
- Open, don’t wall it off. Windows – see inside and outside
- See flora/fauna, visual inspiration from the building
- Landscape is unique. Not just grass that you mow.
- Demonstration of sustainability
- Decorative downspouts, gutters, rainwater collection.
- No dead animals, all sustainable practices.
- Go through tunnel to get to the building, then explodes.

B. Describe the space itself as if you were walking through the front doors with a friend or family member. What do you see? What does it feel like?

- Variety of quiet/noisy spots
- Cozy, quiet spot to gather around a hearth.
- Space for gold interpretation
- Enter and see staff, people to greet you. Warm, inviting, friendly reception moment of arrival
- First interaction is the welcome desk: store isn’t in the way.
- Exhibits show and educate
- Open, level, bring outside in
- View of watershed, view to farm
- More teasers to draw visitors in
- Open, airy, naturally lit
- Connect to outdoors: leads to outside and ultimately to live animals
- Provide experience for those who can’t have it

C. Imagine an exciting and active moment spent at the building, describe your experience.

- Human interaction: experts, stories. teaching moments. i.e. dragonfly larvae
- See something you couldn’t see otherwise: over-sized exhibits.
• Jumping off point to help people enjoy their experience.
• Demonstrate value of resource: show what would have happened if not saved
• Mostly an outdoor experience: the building is a start or end to the experience
• Exhibit that explains the real, don’t fake it.
• Get info on the tree canopy
• Visitors center is within the Nature Center.
• Animals as permanent display.
• Better hub for school programs.
• District Story
• Native American
  o REI exhibit Seattle
  o value of the origination
  o how did this earth come about
  o cultural
Tilden Environmental Education Center
11/11/16
Project and Design Goals

Enhance the Nature Area’s inherent characteristics and benefits
- Take advantage of Tilden being on the urban edge
- Provide opportunities to relax, socialize, and enjoy being outdoors
- Enhance the sense of this special place

Support the delivery of Park programs and information
- Provide a welcoming hub for the entire nature study area
- Bring the resources of the Park to the visitor and student
- Draw people to the Visitor Center to learn about the diverse site opportunities from Visitor Center staff
- Provide a departure and wrap-up point for adventures within the nature study area
- Provide clear wayfinding from the moment you arrive by bus, bike or car
- Deliver school programs under optimal conditions and without disrupting other functions of the EEC
- Provide opportunities for all ages: tots and parents, seniors, and teens and 20-somethings

Develop exhibits (indoors and outdoors) that are varied, engaging, inspiring
- Include opportunities for contemplation and inspiration
- Include a bigger picture view of history
- Interior exhibits provide opportunities that can’t be provided outside

Integrate the facility with the site and the Nature Area
- Integrate the building with the landscape
- Connect indoor and outdoor spaces to one another
- View the watershed resource from the interior
- See the interior activity from the exterior

Provide universal access
- Provide an accessible path to the building and within the building
- Deliver interpretive experiences for those who cannot have them in the out-of-doors

Improve functional relationships within the Visitor Center
- Provide logical relationships between uses
- Provide good sight lines within the Visitor Center
- Provide central information and orientation with good oversight
- Provide logical circulation

Maximize and demonstrate sustainable design strategies
## BUILDING AND SITE FUNCTIONAL PROGRAM

### PROPOSED SPACES BY FUNCTION

<table>
<thead>
<tr>
<th>Existing Area</th>
<th>Ideal Area</th>
<th>% Increase</th>
<th>Proposed Capacity</th>
<th>Uses/Users</th>
<th>Next To (Adjacency)</th>
<th>Views</th>
<th>Cont. plans</th>
<th>Inspirational</th>
<th>Meeting Space</th>
<th>Cultural</th>
<th>Wet Activities</th>
<th>DRY Activities</th>
<th>Other attributes</th>
</tr>
</thead>
</table>

### PUBLIC Interior

<table>
<thead>
<tr>
<th>Space Type</th>
<th>Existing Area</th>
<th>Ideal Area</th>
<th>% Increase</th>
<th>Proposed Capacity</th>
<th>Uses/Users</th>
<th>Next To (Adjacency)</th>
<th>Views</th>
<th>Cont. plans</th>
<th>Inspirational</th>
<th>Meeting Space</th>
<th>Cultural</th>
<th>Wet Activities</th>
<th>DRY Activities</th>
<th>Other attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobby</td>
<td>1,300 sf</td>
<td>600 sf</td>
<td></td>
<td>300 sf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Welcoming</td>
</tr>
<tr>
<td>Store/Gift Shop</td>
<td>200 sf</td>
<td>200 sf</td>
<td></td>
<td></td>
<td>small - kiosk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Closeable, contained, defined quality vs. quantity</td>
</tr>
<tr>
<td>Exhibits</td>
<td>2,900 sf</td>
<td>2,900 sf</td>
<td></td>
<td>0</td>
<td>size of tunnel + jewel lake room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flexible Quick stops with Audio</td>
</tr>
<tr>
<td>Classrooms 1 (with Lab)</td>
<td>1,200 sf</td>
<td>350 sf</td>
<td>0</td>
<td>Move Classroom to Junior Ranger Lodge</td>
<td>35 people</td>
<td>Laboratory</td>
<td>close to outdoors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Part day, part day</td>
<td>could be stand-alone structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classrooms 2</td>
<td>350 sf</td>
<td>1,000 sf</td>
<td>0</td>
<td>Fireplace nook</td>
<td>35 people</td>
<td>storage for lunch/bad packs</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Amphitheater could be sued as classroom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditorium/Theater</td>
<td>1,300 sf</td>
<td>1,600 sf</td>
<td>0</td>
<td>1,500 sf</td>
<td>75-100 seats</td>
<td>Puppet Shows, Orient School Group Media Presentations, Lunch for school groups in rain</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Stand-alone structure — entrance separate from VC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restrooms</td>
<td>360 sf</td>
<td>600 sf</td>
<td>0</td>
<td>600 sf</td>
<td>fold trip surges, 4 wc / 2 lav @ each side</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Access inside &amp; outside, easy access from entrance, on student route into bldg., near intersection</td>
</tr>
<tr>
<td>Halls &amp; Entries</td>
<td>1,075 sf</td>
<td>100 sf</td>
<td>0</td>
<td>south entry + north entry + hall at aud. /</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Access to &amp; from outdoors, intersection.</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL PUBLIC INTERIOR**: 7,285 sf

### STAFF Interior

<table>
<thead>
<tr>
<th>Space Type</th>
<th>Existing Area</th>
<th>Ideal Area</th>
<th>% Increase</th>
<th>Proposed Capacity</th>
<th>Uses/Users</th>
<th>Next To (Adjacency)</th>
<th>Views</th>
<th>Cont. plans</th>
<th>Inspirational</th>
<th>Meeting Space</th>
<th>Cultural</th>
<th>Wet Activities</th>
<th>DRY Activities</th>
<th>Other attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices</td>
<td>125 sf</td>
<td>100 sf</td>
<td></td>
<td>100 sf</td>
<td>1 work station</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>View of natural areas</td>
</tr>
<tr>
<td>Supervising Naturalist Office</td>
<td>125 sf</td>
<td>100 sf</td>
<td>0</td>
<td>100 sf</td>
<td>1 work station</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Assistants</td>
<td>125 sf</td>
<td>150 sf</td>
<td>0</td>
<td>150 sf</td>
<td>2 work stations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Office</td>
<td>650 sf</td>
<td>500 sf</td>
<td>0</td>
<td>600 sf</td>
<td>30 Workstations + 5 Naturalists, 2 SA'S (Student Aids)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Docent Area</td>
<td>150 sf</td>
<td>150 sf</td>
<td>0</td>
<td>150 sf</td>
<td>2 Rec Staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conference Room (Library)</td>
<td>330 sf</td>
<td>400 sf</td>
<td>0</td>
<td>400 sf</td>
<td>25 at a table</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>with Sink</td>
</tr>
<tr>
<td>Meeting Space</td>
<td>250 sf</td>
<td>0</td>
<td>0</td>
<td>combine with Conference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Kitchen &amp; Breakroom</td>
<td>130 sf</td>
<td>225 sf</td>
<td>0</td>
<td>225 sf</td>
<td>serves 20 employees, 6 at a table</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallway</td>
<td>125 sf</td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL STAFF INTERIOR**: 1,485 sf
<table>
<thead>
<tr>
<th>STAFF Support/Service</th>
<th>Storage</th>
<th>810 sf</th>
<th>810 sf</th>
<th>810 sf</th>
<th>same as existing, distributed</th>
<th>Educational outreach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Displays - Life Support</td>
<td>100 sf</td>
<td>100 sf</td>
<td>0</td>
<td>include in classroom</td>
<td>Live Animals</td>
<td>part of exhibits or rear / visible from exhibits</td>
</tr>
<tr>
<td>Staff Restroom(s)</td>
<td>30 sf</td>
<td>225 sf</td>
<td>225 sf</td>
<td>serves 20 employees</td>
<td>[2] single occupancy, 1 w/ shower</td>
<td>with shower, lockers not needed</td>
</tr>
<tr>
<td>Deliveries - Short-term storage</td>
<td>150 sf</td>
<td>0</td>
<td>2x existing</td>
<td>at rear, adjacent to staff</td>
<td>with receiving area</td>
<td></td>
</tr>
<tr>
<td>Janitor Room</td>
<td>80 sf</td>
<td>80 sf</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities / Mechanical</td>
<td>180 sf</td>
<td>150 sf</td>
<td>150 sf</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Shop &amp; Storage</td>
<td>500 sf</td>
<td>500 sf</td>
<td>500 sf</td>
<td>Equipment &amp; supplies for building operations and immediate grounds (vs corp yard.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL STAFF SUPPORT/SERVICE**: 1,620 2,015 1,765 9%

**TOTAL NET INTERIOR AREA**: 10,390 11,990 10,190 -2%  
**Delta between Proposed and Existing Net Area = -200 sf**

**TOTAL GROSS INTERIOR AREA**: 11,400 13,789 11,719 3%

<table>
<thead>
<tr>
<th>PUBLIC Exterior</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphitheater</td>
<td>1,200 sf</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry Meadow</td>
<td>(3) x 600 sf</td>
<td>[5] spaces for 20-30 with benches</td>
<td>connects VC and farm</td>
<td></td>
</tr>
<tr>
<td>Glade</td>
<td>1,500 sf</td>
<td>100</td>
<td>Potluck 2x/year</td>
<td></td>
</tr>
<tr>
<td>Educational Spaces</td>
<td>700 sf</td>
<td>35 people</td>
<td>Place to contemplate what you have learned - destination - simulated?</td>
<td>covered</td>
</tr>
<tr>
<td>Mud &amp; Wet clothes</td>
<td>450 sf</td>
<td>35 people</td>
<td></td>
<td>covered</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STAFF Exterior</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mud Porch (staff)</td>
<td>100 sf</td>
<td></td>
<td></td>
<td>covered</td>
</tr>
<tr>
<td>Outdoor Staff Work Space</td>
<td>200 sf</td>
<td>200 sf</td>
<td></td>
<td>covered</td>
</tr>
<tr>
<td>Staff Parking</td>
<td>7,400 sf</td>
<td>5,200 sf</td>
<td>15-16 stalls, 1 electric</td>
<td>mitigate conflict of parking access and trails/walk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Security Residence</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Residence</td>
<td>1,000 sf</td>
<td>1,000 sf</td>
<td>2 bedrooms</td>
<td></td>
</tr>
<tr>
<td>Carport &amp; Storage</td>
<td>625 sf</td>
<td>625 sf</td>
<td>2 car capacity</td>
<td></td>
</tr>
</tbody>
</table>
EBRPD Tilden EEC Study
Program and Schemes Review Meeting
November 30, 2016

AGENDA

1. Review Comments from EBRPD

   a. Project Goals:

      *Integrate the facility with the site and the Nature Area, and the interpretive mission. (in other words building can be part of the interpretive experience).*

      *Important to stress improved connection between Visitor Center and Little Farm.*

      These comments will be integrated into Project Goals document.

   b. Functional Program: There was general agreement with the revised program eliminating second classroom and using Junior Lodge as potential second classroom. With that said, Dave Edquist voiced concern about losing second classroom due to potential future growth.

      After some discussion, attendees agreed that enhancing the Lodge and enclosing the Farm Classroom are both good approaches to addressing future and even current need for classroom space. S&S to ask Cost Estimator what he would need to provide estimates to improve the Lodge and the It was also discussed that the

      In regards to lifespan of the building, new or renovated, the group agreed that at least 50 to 60 years.

   c. General Comment by Sara Fetterly:

      *Keep in mind how the new building will impact the entrance to the residence, and suggest residence modifications if needed.*

2. Review Diagrammatic Schemes presented by S&S

   a. Renovation Scheme

      Pros:
      *Provide some breathing room*
      *Improve Accessibility*
      *Generally meets programmatic requirements*

      Cons:
      *Still working in wedge shapes*
      *More difficult to engage site*
Extensive site work at south

b. New Building Scheme
   Pros:
   Engage site in a more thoughtful way
   Bring the outdoors in
   Fully meet programmatic requirements

   Cons:
   Unknown costs
Prioritization of Project Goals

12/8/16

Prioritized by Ranked Voting

<table>
<thead>
<tr>
<th>Priority</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5.50</td>
<td>Integrate the facility with the site and the Nature Area</td>
</tr>
<tr>
<td>5.17</td>
<td>Support the delivery of Park programs and information</td>
</tr>
<tr>
<td>4.50</td>
<td>Develop exhibits (indoors and outdoors) that are varied, engaging and inspiring</td>
</tr>
<tr>
<td>4.17</td>
<td>Improve functional relationships within the Visitor Center</td>
</tr>
<tr>
<td>4.08</td>
<td>Enhance the Nature Area's inherent characteristics and benefits</td>
</tr>
<tr>
<td>3.33</td>
<td>Maximize and demonstrate sustainable design strategies</td>
</tr>
<tr>
<td>1.25</td>
<td>Meet the District's financial goals</td>
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Priority 1 equals 7 points

<table>
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<th>Priority</th>
<th>Points</th>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>5</td>
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<tr>
<td>4</td>
<td>4</td>
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<td>5</td>
<td>3</td>
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<tr>
<td>6</td>
<td>2</td>
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<td>7</td>
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### Scheme Ranking

<table>
<thead>
<tr>
<th>Schm Pts</th>
<th>Goal Ranking</th>
<th>Total</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>4.08</td>
<td>89.83</td>
<td>Enhance the Nature Area's inherent characteristics and benefits</td>
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<tr>
<td>22</td>
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<td>113.67</td>
<td>Support the delivery of Park programs and information</td>
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<td>21</td>
<td>4.50</td>
<td>94.50</td>
<td>Develop exhibits (indoors and outdoors) that are varied, engaging and Inspiring</td>
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<td>20</td>
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<td>110.00</td>
<td>Integrate the facility with the site and the Nature Area</td>
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<td>23</td>
<td>4.17</td>
<td>95.83</td>
<td>Improve functional relationships within the Visitor Center</td>
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<td>21</td>
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<td>70.00</td>
<td>Maximize and demonstrate sustainable design strategies</td>
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<td>1.25</td>
<td></td>
<td></td>
<td>Meet the District's financial goals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provide universal access</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>573.83</strong></td>
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### New Building Scheme

<table>
<thead>
<tr>
<th>Schm Pts</th>
<th>Goal Ranking</th>
<th>Total</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>4.08</td>
<td>134.75</td>
<td>Enhance the Nature Area's inherent characteristics and benefits</td>
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<td>5.17</td>
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<td>Support the delivery of Park programs and information</td>
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<td>Develop exhibits (indoors and outdoors) that are varied, engaging and Inspiring</td>
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<td>34</td>
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<td>187.00</td>
<td>Integrate the facility with the site and the Nature Area</td>
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<td>27</td>
<td>4.17</td>
<td>112.50</td>
<td>Improve functional relationships within the Visitor Center</td>
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<td>31</td>
<td>3.33</td>
<td>103.33</td>
<td>Maximize and demonstrate sustainable design strategies</td>
</tr>
<tr>
<td>1.25</td>
<td></td>
<td></td>
<td>Meet the District's financial goals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provide universal access</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>856.58</strong></td>
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## Scheme Comments

<table>
<thead>
<tr>
<th><strong>What do you like about the RENOVATED scheme?</strong></th>
<th><strong>What do you wish was different about the RENOVATED scheme?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AF</td>
<td>Patio</td>
</tr>
<tr>
<td>AF</td>
<td>New Entry</td>
</tr>
<tr>
<td>DM</td>
<td>Preserving history of EEC</td>
</tr>
<tr>
<td>DM</td>
<td>Compact, non-intrusive design</td>
</tr>
<tr>
<td>DM</td>
<td>All rooms within line of sight</td>
</tr>
<tr>
<td>DM</td>
<td>Entry adjacent to the Farm</td>
</tr>
<tr>
<td>DZ</td>
<td>Pathways to and from various points of the building</td>
</tr>
<tr>
<td>DZ</td>
<td>Entrance plaza</td>
</tr>
<tr>
<td>DZ</td>
<td>One level</td>
</tr>
<tr>
<td>AK</td>
<td>Opening up of space</td>
</tr>
<tr>
<td>AK</td>
<td>Relocating entrance</td>
</tr>
<tr>
<td>JW</td>
<td>Level</td>
</tr>
<tr>
<td>JW</td>
<td>Open entryway</td>
</tr>
<tr>
<td>JW</td>
<td>Keeps services the same</td>
</tr>
<tr>
<td>GB</td>
<td>Restroom -- inside/outside entrance</td>
</tr>
<tr>
<td>GB</td>
<td>One level</td>
</tr>
<tr>
<td>SF</td>
<td>Amphitheater for kids out back door</td>
</tr>
<tr>
<td>SF</td>
<td>Classrooms close to exhibits</td>
</tr>
<tr>
<td>SF</td>
<td><strong>Restrooms location and outdoor access with large patio</strong></td>
</tr>
<tr>
<td>MH</td>
<td>New entrance</td>
</tr>
<tr>
<td>MH</td>
<td>Amphitheater area</td>
</tr>
<tr>
<td>MH</td>
<td>Windows</td>
</tr>
<tr>
<td>LC</td>
<td>One level</td>
</tr>
<tr>
<td>LC</td>
<td>New entrance</td>
</tr>
<tr>
<td>IP</td>
<td>Compact feature of everything connected</td>
</tr>
<tr>
<td>IP</td>
<td>Small outdoor fire pit area - would like this feature</td>
</tr>
<tr>
<td>IP</td>
<td>(Red dot on drawing did not correlate to items written)</td>
</tr>
<tr>
<td>JD</td>
<td>Maintains shell of a building with a long history in community</td>
</tr>
<tr>
<td>JD</td>
<td>Inward focus</td>
</tr>
<tr>
<td>JD</td>
<td>Entry plaza continuation into Little Farm</td>
</tr>
<tr>
<td>DE</td>
<td>The garden amphitheater</td>
</tr>
<tr>
<td>DE</td>
<td>Porches</td>
</tr>
<tr>
<td>DE</td>
<td>Location of entrance relative to Little Farm -</td>
</tr>
<tr>
<td>DE</td>
<td>Move to 2/3'o'clock (rather than 4/5 o'clock)</td>
</tr>
</tbody>
</table>

### What do you like about the NEW scheme?

- AF: A lot
- AF: Restroom arrangement
- AF: Courtyard
- AF: Flow
- DM: Availability of light
- DM: Offices next to exhibit
- DM: A large amount of outdoor space for activities
- DZ: Communication with Little Farm
- DZ: Multiple places to gather outdoors
- DZ: Multiple entry points to campus & ways to NA from campus
- DZ: More functional relationships between various parts of the building
- AK: New building, fresh concept and better layout

### What do you wish was different about the NEW scheme?

- AF: Staff Parking
- DM: Spread out makes programs difficult during short staffing
- DZ: Shared entry path to Farm & EEC. Make curved, pleasing
- DZ: Staff Parking
- DZ: Explore smaller side patio between two arms/structures
| JW  | Campus feel                              | JW  | Patio space between Farm and TEEC -- make larger |
| JW  | Large roof lines                         | JW  | Staff parking -- apply pattern language (Christopher Alexander) |
| JW  | Buildings match the architecture of "parks" buildings | JW  | Staff parking |
| JW  | Covered entry and porches                | JW  | Percentage apply pattern language (Christopher Alexander) |
| JW  | Open                                     | JW  | Percentage apply pattern language (Christopher Alexander) |
| GB  | Covered areas                            | GB  | Staff parking - unsightly, unsecure, brings driving down "trail" |
| GB  |                                          | GB  | Harder to secure different buildings |
| GB  |                                          | GB  | Lacks flow (feng shui) |
| SF  | Connection to the Farm                   | SF  | Staff parking |
| SF  | Windows in all rooms                     | SF  | Separation between shop and classroom - wants more and |
| SF  | Indoor/outdoor connection is excellent   | SF  | wants acoustical separation. |
| SF  | Opportunities for exhibits outdoors      | SF  | |
| SF  | Improved access to trails                | SF  | |
| SF  | Staff area patio                          | SF  | |
| MH  | Outside program areas                    | MH  | Staff parking - unsecured. Parking in back or on side |
| MH  | Farm access to new building              | MH  | Parking to and behind Shop - need more |
| MH  | Open effect                              | MH  | Buckeye in front - remove |
| LC  | Looks great                              | LC  | Staff parking |
| LC  | Outdoor halls                             | LC  | |
| IP  | Better connection between Farm and building | IP  | Staff parking |
| IP  | More outdoor areas for groups to gather  | IP  | Addition of small outdoor fire pit area (on rear patio) |
| IP  | More options for indoor space access before/after VC hours | IP  | Rear Patio roof - make retractable |
| IP  |                                          | IP  | Shop separated from Shop |
| IP  |                                          | IP  | General questions/curiosities: |
| IP  |                                          | IP  | > What exhibits will be? |
| IP  |                                          | IP  | > What will overall visitor experience be like? |
> How interactive will the exhibits be?

| JD | Campus allows for better indoor/outdoor relationships |
| JD | Interweaving of paths through the facility |
| JD | Main entry needs to be more prominent |
| JD | Office is distant from main entry desk |
| DE | Lots of light |
| DE | Informal space |
| DE | It proves that a campus is possible |
| DE | Courtyard space |
| DE | Office position |
| DE | Classroom - Need one more |
| DE | Informal spaces - Could use more |
| DE | Covered and uncovered extensions - Fingers need more extension, covered and uncovered onto site Conditioned (main building); covered walk with seating to CR; open air seating to meadow; trail into forest |
| DE | Connection to Farm |
APPENDIX F: PROGRESS MEETING NOTES

PROGRESS REVIEW MEETING NOTES – DRAFT

PROJECT  Tilden Environmental Education Center
DATE  02/09/17 (DRAFT Notes issued 2/14/17)
LOCATION  East Bay Regional Park District, 2950 Peralta Oaks Court, Oakland, CA
ATTENDEES  
Jim Devlin (JD), Project Manager, East Bay Regional Park District
David Zuckermann (DZ), North/West Regional Interpretive and Recreation Services Manager, EBRPD
Anne Kassebaum (AK), Chief of Interpretive and Recreation Services, EBRPD
Susi Marzuola (SM), Project Principal, Siegel & Strain Architects
Bob Borinstein (BB), Construction Cost Estimator, R. Borinstein Company

MATERIALS DISTRIBUTED AT MEETING
TEECC Budget Estimate Report dated 2/9/17
Concept Plan TEEC Renovation Scheme, documents dated 12/14/17 – 1/9/17
Concept Plan TEEC New Schemes, documents dated 12/14/17 – 1/9/17
TEECC Functional Program document dated 12/08/16
TEECC Workshop summary document dated

MEETING NOTES
Please notify S&S of any revisions to notes within five days of draft receipt, after which time the notes will reissued as final with any requested revisions.

1. Conceptual plan estimates for Renovation and New Building schemes
   a. Review of estimates
      • AK would like to see a complete project budget – including soft costs, exhibit design, and furniture, fixtures and equipment (FF&E). BB said he could provide a worksheet to JD as a starting point template for EBRPD’s use in developing a project budget. (Emailed to JD on 2/13/17.) David Edquist is likely a good resource for rough order of magnitude costs for the exhibit design and installation.
      • BB to correct the estimate narrative so the noted exclusions are consistent with the assumptions reflected in the estimate detail.
      • BB to adjust the new building area to match that of the existing building.
      • BB to include sprinklers in the residence as the site is within a very high Fire Hazard Severity Zone as identified by Cal Fire. (http://www.fire.ca.gov/fire_prevention/fhsz_maps_contracosta)
      • BB to complete the estimates once he has completed the additional services estimates. (See item 2 below.)

   b. BB said that his assumptions about the existing renovation are pretty severe because the building will be stripped down to a skeleton. He also said that he cannot anticipate all the unforeseen conditions and related issues in the estimate.
      • It was anticipated that the board will ask about the cost to simply repair the existing building deficiencies. BB and SM explained that making the existing building fully accessible, meeting Cal Green (California’s energy code), and adding sprinklers are all non-negotiable code-requirements. Additionally, and as described in the assessment report, the design consultants indicated that all of the existing building’s systems (mechanical, electrical, lighting) need replacement; the building envelope (including doors, windows, skylights, exterior shingles and insulation) need to be upgraded; and the interior and exterior finishes need to be replaced. In other words, there is no minimal improvement plan. Given the amount of work required to upgrade the building structure, systems, and finishes, making the building fully accessible on one level makes
Tilden Environmental Education Center
Progress Review Meeting

sense, and has the added benefit of making the building much more functional. **BB** to itemize the costs to make the building one level in the final estimate.

c. Evaluation of financial and risk implications of renovation verses new building
   - **BB** said that while the conceptual level construction cost estimate indicates that the renovation of the existing building is less than the construction cost estimate for the new building scheme, there is more risk in the renovation scheme as there are more unknowns likely to be discovered during the construction phase. This risk factor should be reflected in the owner’s project contingency, meaning the contingency EBRPD carries in the project budget for the renovation scheme should be more (that is, a higher percentage) than the construction contingency carried for the new construction scheme.

d. Next Steps:
   - Once approved, **BB** to complete the additional services estimate (Item 2 below) and include in the estimate document.
   - **BB** to finalize the base construction cost comparison between renovation and new building schemes.
   - **JD** to prepare complete project budgets for both schemes.

2. **Additional services request**
   a. Status – **SM** still waiting to hear from BKF on the additional services request. In the meantime, the estimated fees provided by RBC, S&S, landscape architect John Roberts, and MEP Interface Engineers add up to over $10k. This partial total is over the $9,700 Additional Service Allowance in the base agreement. **JD** said he would also like to reserve some of the allowance for an EBRPD board site visit. With that in mind, we agreed to adjust the additional services scope to include only the code-required improvements, including:
      - An accessible path of travel from the existing accessible parking stalls to the site boundary.
      - The upgraded water line required for adding sprinkler systems to the TEEC in either scheme.

The proposed upgrades to the sanitary sewer (including lift stations and holding tanks) and increasing the power service to the Nature Area are both voluntary upgrades that are primarily meant to reduce operational costs and eliminate an on-site propane tank. They are not code-required for either the renovation or replacement schemes and are more complicated to investigate. In the final project report S&S will recommend that these two utility upgrades be investigated as part of the next scope of design work on the project.

   b. **Next Steps – SM** to submit an adjusted additional service fee proposal for the accessible path and upgraded water line as outlined above and in **JD**’s original request for additional services fees.

4. **Final Report & Presentation to Executive Committee and Board**
   a. Preview process – **AK** said that the final report would first be reviewed by internal management, followed by the Board Executive Committee and then the full Board. **JD** will develop the schedule for the review. The design team will not attend the internal management review session, and will attend the Executive Committee and Board meeting.

   b. **S&S** will prepare drafts of the report and presentation for **JD**’s, **AK**’s and **DZ**’s review prior to
it going to executive committee or board.

c. The report to include a concise executive summary on process, assessment findings, project goals, design options, cost summaries, and design option evaluations, followed by a technical appendix that includes the assessment report, the construction cost estimates, the project budgets (provided by EBRPD) and any other detailed project information. JD to send any additional guidelines. (Email from JD on 2/10/17 provides this guidance: Regarding the format for the final report, the District would like the executive summary be less than 10 pages, preferably about 6-8 pages with an appendix containing the more detailed information. The reports are generally in an 8.5 x 11 format.

d. It was agreed that some context and background information would be good to include as background information in the final report. To that end, DZ gave SM a book on the history of Tilden Park. SM will also talk to landscape architect John Roberts (who is a design consultant on the EBRPD Point Pinole project which just went through the same EBRPD review process) about his thoughts on the format and content of the presentation and the report.

END OF NOTES
Tilden Environmental Education Center

EXISTING CONDITIONS ASSESSMENT

December 2, 2016

Prepared for
The East Bay Regional Park District

Prepared by:

SIEGEL & STRAIN Architects

Interface Engineering

IDA Structural Associates

BKF Engineers

John Northmore Roberts & Associates

Margen + Associates
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I. EXECUTIVE SUMMARY

The Tilden Environmental Education Center (EEC) was constructed in 1973 in the Tilden Nature Area of Tilden Regional Park and serves as its main Visitor Center. The East Bay Regional Park District (EBRPD) has initiated a study to determine if the Center should be renovated or replaced by a new building.

Siegel & Strain Architects (S&S), along with a consultant team, conducted a review of the EEC on September 15, 2016 to evaluate the existing conditions of the building and site. The team reviewed the access to the site and buildings; evaluated structural, mechanical, plumbing and electrical systems; reviewed the condition of finishes and architectural elements; and reviewed compliance with the Americans with Disabilities Act (ADA).

The primary concerns for the building which may present obstacles to cost efficiently renovate the EEC are presented below. Other deficiency items and recommendations can be found in the individual discipline evaluation sections of this report.

STRUCTURAL
Structurally, the building appears to be in good overall condition. However, there appears to be insufficient load resisting capacity in the shear walls. Areas of the roof diaphragm do not appear to have sufficient load path to the foundation. Low roof portions of the building do not appear to have lateral load resisting elements or tie to lateral load resisting elements.

Recommended seismic upgrades include:
- Add plywood to existing walls to create new shear walls,
- Add moment frames where insufficient wall lengths are available to provide sufficient lateral resistance.
- Add lateral ties to adjacent walls from lower roof diaphragms to upper diaphragms or provide new lateral load resisting elements such as moment resisting frames to brace the lower roof diaphragms.
- Where the large wall openings do not have adjacent lateral load resisting elements bracing the wall, either add moment frames to brace the openings, decrease the opening sizes to add shear walls to either side of the openings, or add lateral ties to transfer the loads from the wall to diaphragms with sufficient lateral load resisting capacity.

MECHANICAL
Based on observation and discussion with the EBRPD Staff, it is apparent that the building is not receiving sufficient outdoor air and there is minimal temperature control of the various zones. The numerous renovations to the building further complicate the operation of the facility due to inadequate information of how the systems are connected. Based on our observations and discussions with the EBRPD Staff, we recommend that the entire mechanical system be demolished and replaced with new. System components will include:
- New DDC system to provide control for all systems in the building
- Exhaust fans at all restrooms and animals that contain animal exhibits
- Relief fan for lobby use
- Fan coil units at each wing of the building
- Ductwork throughout building
- High efficiency condensing boiler
- Increased quantity of solar thermal collectors and insulated hot water storage tanks on the roofs
- Radiant flooring at the rotunda
- Piping and insulation for hot water
- Replace wall heaters with hydronic radiators at residence
ELECTRICAL
The existing VC electrical distribution system is at the end of its life cycle. The equipment is antiquated and obsolete. We recommend replacing the entire electrical system. New system components will include:
- A new Main Switchboard ‘MSA’ located in a dedicated main electrical room
- Provisional space for a solar photovoltaic inverter located within the main electrical room and 2-pole circuit breaker on Main Switchboard ‘MSA’
- Branch Circuit Panelboards located strategically throughout the EEC.

CIVIL
Water and electric capacity are a significant cost concern for either a remodeled or new building. Further evaluation (outside the scope of this report) is necessary to determine the existing capacity of these services along with the cost associated with upgrading them for either a remodel or new facility.

FIRE
- Per the Orinda Fire Marshall, fire sprinkler upgrades will be required where more than 50% of building is renovated, or when renovated area exceeds 3,600 square feet. Firewater pressure shall be adequate to provide sprinkler flow to the most remote area of the building with some residual. The existing water pressure needs to be tested.
- The existing fire alarm systems for both buildings should be tested to be sure that they are currently in operation. However, we recommend replacing the existing fire alarm system to allow for the latest technology.

BUILDING ENVELOPE UPGRADES
The building envelopes for both buildings require extensive work, including:
- Shake siding and wood trim replacement
- Asphalt Composite Sheet roofing and flashing replacement
- Exterior window replacement at the residence
- Replacement of Plexiglas skylights at rotunda
- Addition of windows for ventilation and daylight at the VC

ACCESSIBILITY UPGRADES
The Visitor Center and the path to it do not accommodate accessible needs efficiently or effectively and will require a complete rethinking of navigation, spatial organization and adjacency of spaces to be accessible moving forward.

PLUMBING
Due to the inability to investigate the below grade piping, it is recommended have a video tape survey to determine the conditions of the below grade piping.
II. INTRODUCTION

The Tilden Environmental Education Center (EEC) was constructed in 1973 in the Tilden Nature Area, a 740-acre preserve located just North of the Tilden Regional Park. TEEC serves as the main Visitor Center (VC) for the Nature Area and Park, and is located directly adjacent to Little Farm, a free, small petting farm. The center is renowned for its naturalist programs, just as Little Farm is for its family friendly activities. The Tilden Nature area has introduced generations of Bay-Area children to the outdoors and has become a cherished location for the East Bay Community.

The EEC consists of the approximately 11,500 s.f. VC as well as an adjacent security residence (approximately 1,500 sf). The VC houses public restrooms, an auditorium, public exhibits, as well as staff offices and storage. The VC was renovated in the 90’s to create new educational exhibits and to address accessibility, but has remained largely unchanged since its construction. The residence is a two bedroom, one bath apartment that is occupied a member of the Park staff. A bedroom addition was constructed at the rear of the residence in 1980, but has also remained relatively unchanged. The East Bay Regional Park District (EBRPD) has initiated a study to determine if the EEC should be renovated or replaced by new buildings.

Siegel & Strain Architects (S&S), along with a consultant team, conducted a review of the EEC on September 15, 2016 to evaluate the existing conditions of the building and site. The team reviewed the access to the site and buildings; evaluated structural, mechanical, plumbing and electrical systems; reviewed the condition of finishes and architectural elements; and reviewed compliance with the Americans with Disabilities Act (ADA).

The team also reviewed the major City of Orinda planning requirements and California Building Code requirements that might influence decisions at this stage of evaluation. Additional code review will take place in later stages of design.

Prior to the site visit, documentation provided by EBRPD was reviewed by the team. These documents included the original construction drawings for the EEC and Residence, renovation drawings for the EEC, as well as the drawings for a residence addition. Existing conditions reports generated by VFA for insurance purposes gave a big-picture understanding of the EEC building components and systems.

On-site observations were made on foot and only those conditions readily apparent and in plain sight were documented. The survey included documentation of the site, and component and system deficiencies only; no building measurements were verified. Photographs were taken for the purpose of documenting the typical conditions observed by the team and were not exhaustive of every space. Photos included herein were chosen to aid in depicting the component and system conditions. Not every deficiency is represented. The roof was not inspected.

Park Maintenance staff and the Tilden Nature Area Supervising Naturalist Sara Fetterly were present at the site visit to answer questions and give additional information about the building performance and deficiencies. This information is included throughout the sections in the report where appropriate.
III. LANDSCAPE EVALUATION

Executive Summary
The EEC building is in a clearing in a typical East Bay Hills upland landscape set between native mixed evergreen/oak woodlands on the hillside above and dense riparian woodlands along Wildcat Creek below the site. An irrigated turf lawn surrounds the building. The overall condition of the native landscape is healthy and a good reflection of the natural ecology of the area, but the designed physical connections between the building and its ecological setting are very limited, especially considering the educational function of the facility.

The irrigated lawn is inconsistent with the native landscape setting, requiring summer watering, mowing, fertilization, and other routine maintenance. The lawn, however, is well used for informal recreation, picnicking, small group gatherings, and special events, and is appreciated by visitors to the adjacent Little Farm, the Jewel Lake nature area, and the EEC alike. The future extent and character of the lawn is important for addressing policy questions related to the programming for the new or renovated building as well as for overall environmental stewardship of the facility.

The main entry path to the front door of the building does not meet accessibility standards in its current configuration. The steepness of the existing longitudinal slope would likely require hand rails and periodic landings at a minimum to meet ADA. The designated accessible route to the building along the pathway shared with the Little Farm has periodic landings without handrails, and leads indirectly to the front door as well as to the rear patio. Confirmation that it meets the 5% max longitudinal slope and other related ADA standards is needed.

EXISTING SITE
The existing EEC is cut into a small open knoll on the east side of Wildcat Creek next to the Little Farm and above the main Wildcat Creek trail to Jewel Lake. It is surrounded by an irrigated turf lawn that is well used by visitors to the general area. A native woodland with Coast Live Oaks, Bay, Douglas Fir, Coast Redwood, and Big Leaf Maple trees intermixed with Pines and Eucalyptus surround the lawn on the northern and eastern upland sides. A dense riparian woodland along Wildcat Creek with Alder, Willow, Bay, Big Leaf Maple, Buckeye, and Coast Live Oaks enclose the space below the pathway on the western side of the building. Native Big Leaf Maples, Coast Live Oaks, Buckeys, and Coast Redwood trees are clustered in planting beds about the building.

LANDSCAPE
The immediate landscape context for the building is a manicured irrigated lawn with small planting beds near the main entry and along the perimeter walls. While native plants are generally used in the planting beds, they are generally disconnected from the surrounding native landscape setting. Outdoor spaces at the building for gathering, interpretation, and orientation are limited to small paved/decked areas at the front and rear entries with direct access to the lawns. The building is cut into the hillside with stormwater runoff directed around the building via a moat-like drainage ditch at the foundation level significantly below the floor level with storm drains at the bottom of the ditch.

The rear of the main building is an asphalt paved service yard and staff parking lot that also provides access to the residence. This service yard is inaccessible to the public, but the large area is highly visible and directly off of the main Wildcat Creek Trail that leads to Jewel Lake, a primary resource for the EEC. Some service/maintenance functions at the building require access at this location, but the staff parking could possibly be relocated.

The residence is contained within a 6’ wood fence and includes a courtyard garden on the south and a planted landscape on the north.
**Items of Concern/ Deficiencies**

- Physical connections between the building and its landscape setting are limited to the front and rear entries with few windows, gathering areas, outdoor interpretive facilities, or other relationships appropriate to an environmental education center with the purpose of relating visitors with the environment.
- Accessible pathway linkages with the primary resources of the general EEC area, including Jewel Lake, are circuitous and may not meet accessibility standards.
- The service yard is highly visible and an intrusion into the natural landscape character of the Wildcat Creek Trail.
- Storm drainage around the building does very little to inform visitors about ecological connections between the built and natural environments or to transform an engineering requirement into an environmental asset with ecological value. The proximity of the drainage to the building represents a risk of damaging the building should the storm drains fail.
- The extensive irrigated lawn is contradictory to the primary environmental stewardship message of the EEC.

**Recommendations**

Expand the number and location of outdoor gathering/interpretive areas in conjunction with the building renovation/replacement. Specifically consider areas southwest around the entry and toward the creek, to the south (toward the Little Farm), to the northwest (toward Jewel Lake), and to the east toward the hillside forest.

Create fully accessible pathway connections with the front entry, the rear plaza, other outdoor patios, and with the primary resource trails.

Consider relocating and expanding the staff parking (up to 16 vehicles) to the north side of the complex and converting the existing parking area into an accessible trail connection with Wildcat Creek Trail including gathering areas. A fenced separation for the remaining service area and the residential access will be required.

Consider incorporation of a modified stormwater management creek-like swale through the meadow away from the building and connecting with the creek.

Consider reconfiguration/replacement of the lawn with drought tolerant meadow grasses including areas for recreational use, outdoor activities, and seating.
IV. ACCESSIBILITY EVALUATION

The EEC and surrounding site were surveyed on September 8th and 12th for ADA and California Building Code compliance. The survey began at the accessible parking located nearest to the facility and adjacent to the bus stop, and included the path of travel to the building, the main entry, the rear entry and the building interior. The interior of the residence was not accessible at these times and was not specifically surveyed. General observations made from photographs of the residence will be included herein.

The existing accessible path of travel begins at the accessible parking stalls. A sidewalk leads past a bus stop, alongside the vehicular turn around and down to a wooden bridge. Although it is not made clear to the visitor, the accessible route then turns right, up the vehicular pathway towards Little Farm. A level sidewalk runs perpendicular to the vehicular path and winds around the EEC auditorium to the south main entrance. Park staff reported that that the path of travel to the EEC was improved during recent renovations to the neighboring Little Farm property, however an itemized list of these changes was not located. Despite these improvements, there remain serious deficiencies along the path of travel. Generally, the path of travel to the building is not accessible; however, many of the deficiencies identified can be accommodated relatively straightforward solutions. A major overhaul of the pathway is not required unless desired.

The visitor center, as designed, is not an accessible building. The main lobby is located five steps above the entry (and main) level of the building. In 1992, as indicated by renovation drawings provided by the District, a ramp was installed in a room adjacent to the main entry which allows access to the lobby. An exhibit with sloping walkways was created, and an accessible lift was installed to provide access to the existing restrooms (also at entry level). An accessible restroom was also constructed. Despite these revisions and additions, the EEC does not accommodate accessible needs efficiently or effectively and will require a complete rethinking of navigation, spatial organization and adjacencies to be usable moving forward.

*Beyond the wooden bridge, the path of travel splits. The path towards the EEC, shown straight ahead, is too steep. The path to the right towards Little Farm is likely a better option for accessible path of travel.*
Items of Concern/Deficiencies

PATH OF TRAVEL

- A towing sign is required at the accessible parking spots - to indicate that unauthorized vehicles will be towed.
- Detectable warning strips are missing and/ or inadequate where the sidewalk intersects with parking and vehicle crossing. Jurisdiction having authority (JHA) will need to indicate locations for new strips.
- The slope of the walkway immediately west of the parking lot is too steep and requires handrails and wheel guides per ramping requirements.
- A wheelchair space adjacent to the existing bench is missing at the bus waiting area.
- A large tree limb overhangs the path of travel near the vehicle turnaround and presents an obstacle to the visually impaired.
- A cross slope of greater than 2% is present at the pathway to the wooden bridge. This pathway is too steep and requires handrails and wheel guides per ramping requirements.
- The vehicle pathway of decomposed granite and asphalt leading to Little Farm is inconsistent in slope percentages and in places is too steep, requiring handrails or selective regrading to lessen the slope.
- The primary pathway from the bridge to the EEC main entrance is too steep without handrails or intermediate landings and requires rethinking for access to this entry.
- The wood entry platform at the main entrance has a gap between the guardrail and the end of the platform at each side. This presents a drop off hazard for wheelchairs. Wheel guides are required in these locations.
- The map display at the west entry is not within accessible reach range.
- There is a gap between the West wall and wood platform at the building entry. This presents a drop off hazard for wheelchairs. The flooring should be made continuous to the wall.
MAIN ENTRY

- The panic hardware on the main entry doors has exposed vertical rods.
- The main entry doors require more than 5 pounds of opening force to enter. A door activator is required.
- Tactile signage is required at all exits. *applies to all exits, not just main entry.

SOUTH VESTIBULE

- The map display at the east wall projects too far from the wall and is a protruding object.
- The stairs from the vestibule to the lobby do not have adequate extensions.

JEWEL LAKE ROOM

- The ramp to the lobby has non-compliant handrails. Handrails are not graspable with one hand and do not extend beyond ramp. The ramp is too steep at its base and does not provide a landing at the change in direction.
- The emergency exit has a door in series with <48" from edge of door to adjacent door. There is a 2/12" CIL on the exterior side. No tactile exit signs are provided.

LOBBY/ ROTUNDA

- The sales desk does not have a lowered portion of counter.
- There is inadequate space behind the sales desk for wheelchair maneuvering.

NORTH VESTIBULE

- The drinking fountain does not provide high and low stations.
WATERSHED TUNNEL
- The stones at the tunnel entry have changes in level greater than 1/2”.
- The slope at the entry is too steep and requires handrails and wheel guides per ramping requirements.
- The portion of tunnel perpendicular to main tunnel presents a change in direction and a landing is required per ramping requirements. The cross slope in the perpendicular tunnel is too steep.

AUDITORIUM
- The pair of doors at the entry is too narrow. One leaf has an exposed vertical rod at the panic hardware.
- A portion of accessible counter with knee access is required at south counters.
- Access to a sink is required at the south counters.
- The light switches for the room are above permissible accessible reach ranges.
- Access to the stage is not provided.

READING ROOM
- The entry to the performing area is through an exterior door. There is no walkway or accessible route to the door. The door has a CIL and knob hardware.
ACCESSIBLE RESTROOM
- The defibrillator case in the hallway near the restroom is a protruding objet.
- Adequate clearance is not provided in front of the toilet.
- The Toilet is greater than 18” from the wall.
- The handle for the diaper changing station is above permissible reach range requirements.
- The piping beneath the lavatory is not insulated.
- The coat hook on the bathroom door is above permissible reach range requirements.
- The signage on all restroom doors is not compliant.
- Tactile signage is not provided at any restrooms.

REAR YARD
- The employee parking lot at the rear yard has 11 spaces. None of the spaces are accessible. The best location for accessible parking would be at the spaces closest to the entry ramp. Some regrading may be required to ensure a maximum cross slope of 2% for the accessible space and its accessible route.
- The ramp at the rear entry connects the Animal Room to the Jewel Lake room and does not connect to the staff offices; there is no accessible entry to the staff offices. The ramp has an intersecting slope at the base (14.4% to 11.8%) and no level bottom landing. The slope of the ramp is 11.8%. There is no edge protection or handrails.

ANIMAL ROOM
- There is a 2-1/2” change in level (CIL) at the entrance.
- The entry door has knob hardware.
- The counters are 36” AFF and no lowered section is provided.
- There is no knee space under the sink.
- The interconnecting door to the Pond Room has a clear width of 29” and knob hardware.
OFFICES
- The main entrance has a 3" CIL and no ramp. Most of the doors in the interconnecting offices are 29"-30" wide with knob hardware.

KITCHEN
- The kitchen/break room has no latch side clearance at the pull side of the door, and no lowered counters or knee space at the sink.

EMPLOYEE STAIRS
- There is no accessible route between levels. The connecting stair has 6 risers. The stairs lack contrast stripping, handrails on both sides and proper handrail extensions.

EMPLOYEE RESTROOM
- There is one very small single accommodation restroom with no accessibility features.

RESIDENCE
- Generally, maneuvering space is not adequate throughout the apartment. Clear spaces are likely inadequate at doors and door widths may be too narrow. Hardware at doors and windows are not compliant. There is no accessible bathroom or kitchen.

The staff kitchen has very little maneuvering room and no lowered counters and knee space at the sink.

The kitchen at the residence does not provide maneuvering space or an accessibly portion of counter.

Door hardware at the residence is non-complaint. Many of the doors may be too narrow.
Recommendations

Significant effort would be required to reconfigure the path of travel from the parking lot to the EEC. Adding handrails, landings as needed, and guardrails to meet ramping requirements along the path may diminish some of the open feeling of the park, however this type of intervention is minimally invasive and is recommended in lieu of rerouting the path. It is recommended to continue to route the path of travel from the wooden bridge around to the East towards Little Farm. A portion of the vehicular pathway might be re-purposed (and regraded) for a new path. Signage should clearly mark the accessible path of travel and entry. A more intensive survey should be completed to determine the exact requirements of the exterior path when more specific design plans are made for the EEC.

The interior of the EEC will require a complete rethinking to allow free access between the raised center rotunda and lower surrounding wings. To minimize ramping, it is suggested to move the restrooms adjacent to main entry, where they can be accessed at the same level. New fixtures, including drinking fountains, should be accessible. The tunnel exhibit will require significant alteration and perhaps replacing it with exhibits on level ground. Any existing exhibits to remain, and certainly all new exhibits, should accommodate the hearing and visually-impaired. The employee space should be reconfigured to provide an accessible restroom, a kitchen with accessible accommodations, and easy access to the center rotunda. Note that any new exits must meet accessibility standards.

The residence building should be remodeled to allow more maneuvering space within, provide an accessible restroom and kitchen space. Both entrances (front and rear) should be reworked to allow accessible entry.
V. BUILDING STRUCTURE EVALUATION

Summary

VISITOR CENTER

IDA Structural Engineers (IDA) has performed a seismic evaluation of the Tilden Environmental Education Center (TEEC) Building, located at 600 Canon Drive, Berkeley, California, using an ASCE-41-13, Tier 1 seismic evaluation procedure performed to a Life Safety Level of Performance. ASCE 41-13, titled “Seismic Evaluation and Retrofit of Existing Buildings,” published by the American Society of Civil Engineers (ASCE) in 2013, is the industry standard procedure for the seismic evaluation and retrofit of existing buildings.

The building is a one story wood framed structure constructed on a radial grid. The wood framed roof is constructed of stepped planes creating high roof and low roof conditions.

The primary intent of the Tier 1 screening based procedure is to evaluate and where warranted, reduce seismic risk efficiently where possible and appropriate by using simplified procedures targeted to a specific building type. A building meeting a Life Safety Level of Performance is expected to experience a moderate amount of damage during a seismic event. Continued occupancy is unlikely without repair. The building may not be economical to repair. A summary of items identified as potential deficiencies under the Tier 1 screening are noted below. (See Appendix C for ASCE-41-13 Evaluation Forms)

A site visit was performed on September 15, 2016 to perform a visual observation of the existing building site. The building appeared to be in good overall condition. An area of slab on grade exhibited signs of cracking and settlement. A park ranger who has performed maintenance of the building noted signs of settlement at doors and windows.

RESIDENCE

IDA Structural Engineers (IDA) has performed a seismic evaluation of the Tilden Environmental Education Center (TEEC) Residence Building, located adjacent to the main TEEC building, using an ASCE-41-13, Tier 1 seismic evaluation procedure performed to a Life Safety Level of Performance. ASCE 41-13, titled “Seismic Evaluation and Retrofit of Existing Buildings,” published by the American Society of Civil Engineers (ASCE) in 2013, is the industry standard procedure for the seismic evaluation and retrofit of existing buildings. (See Appendix C for ASCE-41-13 Evaluation Forms)

The building is a one story wood framed residential structure. Based on the original construction drawings of the building, it appears plywood was used at walls around the carport, but the main residence appears to use gyp board sheathing shear walls for lateral resistance.

The primary intent of the Tier 1 screening based procedure is to evaluate and where warranted, reduce seismic risk efficiently where possible and appropriate by using simplified procedures targeted to a specific building type. A building meeting a Life Safety Level of Performance is expected to experience a moderate amount of damage during a seismic event. Continued occupancy is unlikely without repair. The building may not be economical to repair. A summary of items identified as potential deficiencies under the Tier 1 screening are noted below.

A site visit was performed on September 15, 2016 to perform a visual observation of the existing building site. The building appeared to be in good overall condition.
Items of Concern/Deficiencies

VISITOR CENTER

LOAD PATH
- Portions of the diaphragm do not appear to have a well-defined load path to transfer loads to the foundation.

TORSION
- The building does not have appropriate distribution of walls to resist torsion.

OVERTURNING
- Walls assumed to be shear walls are potentially vulnerable to overturning. Shear walls do not appear to have sufficient holdowns to resist overturning.

REDUNDANCY
- Some areas of diaphragm do not have at least 2 lines of lateral resistance.

SHEAR STRESS CHECK
- A check of the shear stress in the walls using the Quick Check procedure shows the shear stresses exceed the allowable shear stresses.

OPENINGS
- There are walls which are have openings greater than 80% length and do not have structural panels or positive ties capable of transferring forces.

DIAPHRAGM CONTINUITY
- The diaphragm consists of split levels. The lower levels do not appear to have sufficient lateral resistance to transfer loads to the foundation.

ROOF CHORD CONTINUITY
- Chord elements are not continuous across roof elevation changes.

RESIDENCE

OVERTURNING
- Walls assumed to be shear walls are potentially vulnerable to overturning. Shear walls do not appear to have sufficient holdowns to resist overturning.

SHEAR STRESS CHECK
- A check of the shear stress in the walls using the Quick Check procedure shows the shear stresses exceed the allowable shear stresses.

OPENINGS
- There are walls which are have openings greater than 80% length and do not have structural panels or positive ties capable of transferring forces.
Recommendations

VISITOR CENTER

To address the shear strength deficiencies identified in the Tier 1 assessment, add plywood to existing walls to create new shear walls or to lengthen existing shear walls. Strengthened shear walls will also require additional sill plate anchor bolts and new holdown anchors at the edge of the walls. New holdowns will resist overturning of the shear walls.

Towards the center of the building, add moment frames where insufficient wall lengths are available to provide sufficient lateral resistance. These additional frames towards the center of the building will help address the load path deficiencies.

Add lateral ties to adjacent walls from lower roof diaphragms to upper diaphragms or provide new lateral load resisting elements such as moment resisting frames to brace the lower roof diaphragms. Towards the center of the building, add lateral ties to create a continuous chord.

Where the large wall openings do not have adjacent lateral load resisting elements bracing the wall, either add moment frames to brace the openings, decrease the opening sizes to add shear walls to either side of the openings, or add lateral ties to transfer the loads from the wall to diaphragms with sufficient lateral load resisting capacity.

RESIDENCE

To address the shear strength deficiencies identified in the Tier 1 assessment, add plywood to existing walls to strengthen walls. Strengthened shear walls will also require additional sill plate anchor bolts and new holdown anchors at the edge of the walls. New holdowns will resist overturning of the shear walls.

The entrance to the carport is open and does not appear to have any lateral load resisting elements. Either add a moment resisting frame at the opening or strengthen the diaphragm and shear walls at the three remaining sides around the carport so that the opening can be braced as a cantilevered diaphragm system.

Where the large wall openings do not have adjacent lateral load resisting elements bracing the wall, either add moment frames to brace the openings, decrease the opening sizes to add shear walls to either side of the openings, or add lateral ties to transfer the loads from the wall to diaphragms with sufficient lateral load resisting capacity.
VI. ARCHITECTURAL BUILDING EVALUATION

VISITOR CENTER (VC)

The Tilden EEC is a slab-on-grade, one story, wood-framed structure constructed on a radial grid. The building floor plan is a distinctive circular, segmented shape with a central raised rotunda surrounded by projecting radial wings. (See Appendices A & B for building floor plans.) The wood-framed roof is constructed of stepped planes creating high roof and low roof conditions.

EXTERIOR ENVELOPE

Five large, metal, segmented Plexiglas skylights encircle the rotunda roof. Additional skylights were added at the south exhibit spaces during a renovation. Two public entries to the North and South are a storefront style with three pairs of glazed doors each and large wood, tempered plate glass windows to either side. The building has relatively few wood windows; most are situated at the West wing of staff offices. The building exterior is clad entirely in panelized wood shakes with cedar trim. Exterior walls have no insulation, as observed on the original construction documents. The roof is an asphaltic composition sheeting and also has limited insulation.
INTERIOR FINISHES
Interior finishes are generally consistent throughout each space type. The public spaces that are open to visitors primarily have gypsum board walls and ceilings with commercial carpeted floors. Some walls at the interior of rotunda have panelized shakes similar to the building exterior. The Jewel Lake Room has a dropped ACT ceiling. The stairs at the public spaces are concrete with rubber flooring over them. The auditorium also has rubber flooring. The Watershed tunnel exhibit has sloped, painted concrete flooring.

The staff, women’s and men’s restrooms, and restroom vestibules are consistently finished with 2x2 ceramic floor and wainscot tiles, with gypsum above and ACT ceilings. The accessible restroom has new, larger 8x8 ceramic floor and wainscot tiles, with gypsum board at upper walls and the ceilings.

The rear staff areas have vinyl composition tile (VCT) flooring, save the library, which has commercial carpeting, and the kitchen where the VCT has been replaced with a sheet vinyl. All staff areas also have gypsum board walls and ACT ceilings. The majority of storage spaces, as well as the maintenance shop have unfinished concrete flooring with gypsum board walls. The large storage space at the East has areas of VCT flooring. A trench drain has been installed around the electrical panel in this space to avoid water issues.

MAINTENANCE AND RENOVATIONS
In 1992, a largely interior renovation of the space was undertaken to install new exhibits and to make some accessibility accommodations. An accessible restroom was inserted and fixtures in the existing public restrooms were replaced. Park Staff speculated that replacement of the asphaltic sheet roofing may have occurred at that time, however no evidence was found to corroborate that statement. A solar water tank was installed and a radiant flooring system installed in the rotunda. At some point, the north wood entrance patio was replaced with a post-tensioned concrete slab. Canvas tarpers were installed over the rotunda skylights in an attempt to reduce heat gain in the rotunda.
Discussions with maintenance staff indicated that maintenance has occurred on an as-needed basis over the years. Tasks have included re-installing shakes as they fall off, patching the roof as required, and re-flashing or trimming windows to address leaks or dry rot. The building shell is in fair condition for its age and the minimalistic approach to maintenance. Exterior shakes and roofing are in poor shape and will require replacement. The windows and doors are in fair shape and will require weatherproofing. Interior finishes are dated and worn. Many are in need of replacement. The grounds are maintained for plant and lawn upkeep, and drainage around the building and at the roof are attended to by clearing debris from the roof and grade, as well as cleaning the gutters. Generally, the grading around the building is insufficient; it does not slope away at an adequate pitch. A large redwood tree at the northwest corner of the VC is very close to the building. Trenches have been dug around the tree to direct water away from the building; however, the roots cannot be cut according to Park Staff. There is no indication of water intrusion at the building foundation.

RESIDENCE

The residence building is a slab-on-grade, one story, wood-framed structure located at the rear (northwest) of the VC. (See Appendix B for floor plans.) The roof is a flat, built-up roof and is pitched to drain towards a center valley. It was not surveyed. Two skylights are shown on the residence construction drawings, however only one remains at the storage closet. It is metal with Plexiglas glazing. The residence runs roughly north and south, with a large covered carport structure extending out at a 30-degree angle from the south face. The carport shares space with the rear yard of the VC. The building exterior is clad in the same panelized cedar shakes and wood trim as the VC. Study of the original drawings indicates that the walls and roofs are not insulated, similar to the VC. Exterior windows are aluminum, many of them with Plexiglas in place of glass. Interior finishes are basic with carpet and gypsum board walls and ceilings throughout the majority of spaces. The bathroom and storage closet have laminate flooring. The kitchen and dining room have VCT. The doors are hollow metal. Maintenance efforts at the residence mimic the as-needed approach at the Visitor Center.

Overall, the residence building is in fair condition. The exterior, similar to the VC, is in poor condition; the siding and roofing require attention as soon as possible. Exterior doors require weatherproofing, and the inefficient and poorly functioning aluminum windows and skylights should be replaced. The concrete curb along the building perimeter at the west wall exhibits areas of spalls and some cracking. No complaints of water intrusion were indicated and these deficiencies are considered to be aesthetic. Generally, the grading around the building is insufficient; it does not slope away at an adequate pitch.
Items of Concern/Deficiencies

VISITOR CENTER

The following deficiencies are listed in order of building components to coordinate with future construction cost estimating reports. Note that only those components exhibiting wear or deficiency are noted here. Components not noted were generally in fair to good shape. The decision to replace those elements would be primarily a choice of aesthetics.

BUILDING EXTERIOR

Exterior Walls
- Panelized cedar shakes are in extremely poor condition. Shakes are missing from some panels and all shakes exhibit extreme discoloration, water staining and weathering. Complete replacement is recommended.
- Staff reported that bats live in the building siding. A bat relocation plan needs to be considered as part of any construction plan. Summer is a bad time to disturb the bats as they are birthing.
- The North elevation exhibits large areas of bio-growth, which may be indicative of a roof leak or moisture issues in the wall.
- Shed roof shelter below windows at North elevation has completely failed and should be removed. Replace wood lap siding below roof with shakes to match adjacent.
- Flashing is missing at penetrations through siding.

Exterior Windows
- Water staining is evident below sills at windows on staff wing north elevation.
- Water damage is evident at sills of south main entry plate glass windows.
Exterior Doors
- Astragals are needed at main entry doors

Roof Coverings
- Park staff reported that there are areas where the roofing sheeting has pulled up.
- Maintenance staff cleans the roof twice a year.
- Staff reported that bats live in the roof (in flashing) and maintenance staff are reluctant to bother them. A bat relocation plan needs to be considered as part of any construction plan. Summer is a bad time to disturb the bats as they are birthing.
- Wood trim at roof flashing is extremely weathered and pulling away from the roof in places.

Skylights
- Rotunda Plexiglas skylights have become cloudy and crazed due to solar exposure.
- There is evidence of previous leaks at rotunda skylights. Staff reports that there are no current leaks.
- Canvas shades have been installed over the rotunda skylights and roof to reduce glare and heat gain in the rotunda.
- Park staff reported that some of the skylight panes were once operable (via a manual cord), but have not been opened in a long while.

Patios
- The rear/north wood deck was replaced with post tensioned slab. Staff equated the change to issue with nails in the original wood deck that kept “popping”.
BUILDING INTERIOR

Interior Partitions
- Cracking is evident above the wall opening in the east wall of the Jewel Lake Room. Staff reports that these cracks appeared as the building has settled.

Ceiling
- Water damaged ACT at men’s restroom vestibule and several tiles in the Jewel Lake Room.
- The access hatch in the staff library has been covered with ACT that are inconsistent with the rest of the ceiling.

Wall Finishes
- Finishes are outdated, but in fair condition.
- A small portion of shakes at the interior northeast wall of the rotunda show water damage.
- 2x2 ceramic tiles at staff restroom are dated, but in good condition. Mildew and staining appears at grout from water exposure beneath the soap dispenser.

Floor Finishes
- Vinyl Composition Tile Flooring at staff offices is badly worn and beyond useful life.
- VCT in the staff working area has cracked along joint lines as the building has settled.
- The concrete floor in the large east storage room has cracked as the building has settled.
- Partial VCT in the east storage are worn or missing.
- A trench drain was installed around the electrical panels at the east storage to avoid water issues.
- The painted finish in the Watershed tunnel exhibit is worn and chipped in areas.

Water damaged and incompatible ACT tiles located in the men’s restroom vestibule.

The VCT flooring in the staff work area has cracked as the slab below has settled.

The VCT floors have been worn at the desk spaces in the staff work area.
**Sitework**
- The grade is in direct contract with cedar shakes at multiple locations around the building.
- Grading around the building is inefficient to keep water away from foundation.

**Energy Efficiency/ Sustainability**
- There is a general lack of windows in the VC. Daylight and access to views are minimal.
- There is a lack of natural air ventilation in the EC, which can also be equated to a lack of windows.
- Park staff reported that the exhaust fan in rotunda has never worked because it was not connected to the solar panel to power it.
- Park staff reported that there are supposed to be vents for the rotunda but they have become home for bats. Maintenance/park prefers not to disturb bats.
- The building envelope lacks insulation and is generally not airtight.

**Building Security/Fire**
- Park staff reported that the security alarm was switched to Bay Alarm recently. It was previously connected directly to the Park where the Park security was alerted and dispatched. There is some concern that system is not connected correctly and/or functioning.
- Park staff reported that the fire alarm system is not functioning.
RESIDENCE

- The metal Plexiglas windows are inefficient and do not function well.
- There is evidence of moisture issues, with moisture accumulation at window sills and mold on bedroom blinds.
- Panelized cedar shakes are in extremely poor condition. Shakes are missing from some panels and all shakes exhibit extreme discoloration, water staining and weathering. Complete replacement is recommended.
- Staff reported that bats live in the building siding. A bat relocation plan needs to be considered as part of any construction plan. Summer is a bad time to disturb the bats as they are birthing.
- The grade is in direct contact with cedar shakes at multiple locations.
- Grading around the building is inefficient to keep water away from foundation.

Functional building deficiencies
(as reported by Park Staff)
MAIN TEEC ENTRY

- The EEC is difficult to find; there are no windows to see in and it does not present like a public building (not welcoming). It is often missed by visitors
- Signage to the EEC is limited and unclear.

ROTUNDA

- The rotunda gets HOT in the summer
- Maintenance staff installed fabric shades over the Rotunda skylights to reduce heat gain.

STAFF OFFICES

- The offices are cold in winter, but remain cool in the summer.
- Lighting in the EEC in general is not great.

FIRE WELL

- Space is nice – the size is good and it is cozy, but it is treacherous to get into.
- There nothing to look at in the room.

AUDITORIUM

- The auditorium is often very cold. The heating in the room is insufficient.
Recommendations

VISITOR CENTER

EXTERIOR
Any rehabilitation efforts made for the Visitor Center and residence should focus first and foremost on the building envelope and roofing. The cedar shake panels and wood trim should be replaced as soon as possible. Similarly, the composition sheet roofing and related flashing are well beyond their useful lives and require replacement. Any building penetrations, intersecting materials or attached building appurtenances should be properly flashed around at both cladding and roofing. Any flashing at the roof, particularly at the parapet, should also be replaced. A hazardous material effort may be required to accumulation of bat guano or the development of mold when the shakes and roofing are replaced. The drainage system should be investigated further and any necessary repairs or replacement completed while the roof is removed. Although no reports of current leaking have been made, the roof underlayment should also be examined for water damage and replaced as required. The existing rotunda skylights are beyond their useful life and require replacement. These units should be replaced with energy efficient models with UV resistant insulated glazing. Additional interventions may be required to shield the rotunda from sunlight and heat gain; the existing canvas shades are not a good long term solution and should be removed.

The existing building envelope was not constructed with energy efficiency in mind. To improve the situation, insulation should be added to the wall and roof cavities while the exterior is being rehabilitated. Flashing and weatherproofing around windows and doors should also be installed. A blower door test could be completed to more thoroughly assess the air tightness of the building.

Ventilation through the building should also be addressed with the installation of additional windows, exhaust fans and a more effective air handling system. (see Mechanical evaluation for additional information). The addition of windows will also improve the building occupant’s experience by providing access to views and daylighting.

Grading around the base of the building is in need of attention. Soil and debris should be cleared away from the walls to allow a minimum of 8 inches of clearance between the soil and any wood material. The soil should also be graded to flow away from the building at a minimum of 1/8” per foot. A maintenance program should be developed for the EEC to address exterior upkeep for the future. Set tasks, such as cleaning gutters, removing debris from the roof and from the surrounding side yards should be completed at set intervals of time.

INTERIOR
The interior finishes of the VC are generally in fair condition and may have some serviceable life left in them. Should a renovation occur, it is logical that the majority of flooring and wall finishes (paint and tile) would be replaced. It is recommended to replace all VCT in the near future, as it is worn and beyond its serviceable life. New finish materials should be chosen for their sustainable qualities, such as low volatile organic compounds (VOC) and recycled material content. An investigation into the chimney in the fire well should be completed to determine why it does not function. Similarly, the fire alarm should be tested to determine if it functions.

RESIDENCE
The residence exterior exhibits the same failure of roofing and cedar shakes as the VC. Both should be replaced. Exterior windows and skylights are inefficient and should be replace with glazed, UV - resistant units. Grading around the building is also similar to the VC, with soil in contact with wood. The residents spoke of water intrusion issues at the wall behind the prefabricated shower stall in the past, however the issue was corrected. Moisture issues are evident within the apartment, with moisture build-up on the
interior window sills and mold on the rear window blinds. It should be noted that the tenants are collectors of reptiles and have a multitude of aquariums and cages in most spaces of this house. These likely account for the high moisture levels; however, the condition should be investigated further.

**Sustainability Recommendations**  
The renovation of the existing EEC provides a great opportunity to educate the public about how the built environment affects the natural environment. When given a choice and where possible, every effort should be made to choose the option which does less harm. There are many such options.

**RENOVATION**
The choice to renovate the building is, in and of itself, is a sustainable choice. The embodied energy, or the energy and resources required to initially construct the building, will be lost if the building is demolished, and new energy and resources required to construct a new. Additionally, renovating avoids generating excessive amounts of demolition construction waste. Some thought could be given to salvaging existing material if a new center is constructed.

**MATERIAL REPLACEMENT**
The materials placed inside of buildings can have a negative effect not only on the natural environment, but also on building occupant’s health. More and more manufacturers are working to remove the harmful chemicals used in the manufacturing of their products. Low volatile organic compound (VOC) paints, and adhesives are now available. Materials with higher recycled content, and wood products using sustainability farmed and harvested woods are also available.

**ENVELOPE UPGRADE**
Insulation should be added in wall cavities and at roof rafter cavities when the exterior siding and roofing is replaced. More energy efficient windows and doors should be installed and made weathertight with the appropriate flashing and weatherproofing. Code may dictate a limitation on the number of new window openings.

**NET ZERO**
There are a number of strategies, some of which have already been discussed, that can be implemented to reduce fossil fuel use and carbon emissions.
- Make the building envelopes – walls and roofs - more efficient.
- Replace old, inefficient equipment and systems with new efficient equipment and systems.
- Power equipment and systems with renewable energy

If retrofitted, consideration should be given to making the buildings zero net energy and zero net emissions over time. Electricity generated by photovoltaic panels could be used to provide heating. These panels could be purchased with a Power Purchase Agreement at very little upfront cost. It should be noted that there is limited roof area to install PV and/or solar thermal panels. Installation of PV panels should be prioritized over solar thermal panels if space becomes an issue. Additional study of roof shading is required to determine the available amount of space for panel installation.

**RAINWATER HARVESTING FOR IRRIGATION**
Installation of a greywater system (collecting water from roof run off) should be considered for irrigating the landscape.

**NATURAL VENTILATION AND DAYLIGHTING**
Strategic placement of operable skylights and windows could greatly increase natural ventilation through the Center. Additional studies are required. Increased daylighting and ventilation will do much to enhance the user’s experience of the space.
ALTERNATIVE MODES OF TRANSPORTATION

Visitors should be encouraged to travel to the park and visitor center via alternative modes of transportation. This could be accomplished by offering bus shuttles from other areas of the park, or bus lines that come to the park from surrounding cities and neighborhoods. Bike racks could also be installed at various locations throughout the Park.
VII. LIFE SAFETY EVALUATION

Regulatory Description of Existing Condition (per 2013 CBC)

SITE

- Fire Jurisdiction: City of Orinda Fire Marshall
- Located in a Very High Fire Hazard Severity Zone
- Fire equipment access:
  - turn-around located south of the building near road to Jewel Lake
  - building is within 150’ of a truck access point
- Firewater system: pressure may not be adequate.

VISITOR CENTER

- A-3 Occupancy (museums, exhibition halls, lecture halls with more than 50 occupants)
- Type VB non-rated construction
- One story
- Actual Area = 11,500 sf (Allowable area including frontage increase = 10,500 sf)
- Actual Height = 27’ (Allowable height = 40’)
- Exterior finishes: combustible / ignitable.
- Fire separation distance between Residence and Visitor Center is 25 feet. Per CBC Table 602, neither building is required to have a rated exterior wall.
- No automatic fire sprinkler system.
- No communicating fire alarm system.
- Panic hardware is installed at building exits.
- Means of Egress:
  - High occupancy areas (> 49 occupants) have two or more exits.
  - Staff offices, low occupancy (< 49 occupants) has one accessible exit.
- Illuminated exit signs are located throughout the building at circulation corridors and exits.
- Emergency illumination – see section IX Electrical Systems

RESIDENCE

- R-3 Occupancy – single-family residence
- Type VB non-rated construction
- Exterior finishes: combustible / ignitable.
- Fire separation distance between Residence and Visitor Center is 25 feet. Per CBC Table 602, neither building is required to have a rated exterior wall.
- Existing smoke detectors are connected to a fire alarm system
- Egress travel distance is within 75 feet allowed per CBC 1006.3.2 (62 feet from back bedroom)
- One means of egress is allowable per CBC 1006.2.1

Deficiencies (per 2013 CBC)

2013 CBC Chapter 34 parameters for addressing deficiencies in existing structures:

- Repairs: Normal repairs due to abatement of wear and work on non-damaged components required for the repair of damaged components shall not be required to comply with the current building code.
- Alterations: Alterations shall comply with the current building code for new construction. Alterations shall be such that the existing building is no less complying with the current code than it was prior to the alteration.
SITE

- Fire water pressure to be measured. If it is not adequate:
  - Buildings shall be monitored by central monitoring for early notification.
  - New buildings shall be provided with a Fire Department Connection (FDC)
- Vegetation Management plan required: limb-up clearance at roofline and remove build-up of debris at base of building.

VISITOR CENTER

- Fire sprinklers
  - Required by the CBC for A-3 occupancy new buildings.
  - Required by Orinda Fire Marshal when more than 50% of building is renovated, or when renovated area exceeds 3,600 square feet. Firewater pressure shall be adequate to provide sprinkler flow to the most remote area of the building with some residual.
- Ignition-resistant exterior materials required per requirements of CBC Chapter 7a. Full replacement of exterior materials, compliant with Chapter 7a, required by fire marshal for any level of renovation.
- Upgraded fire alarm system required per CBC 907.2.1 for Group A occupancy used for educational purposes.
- Emergency illumination upgrades required, see section IX Electrical Systems
- Staff expressed concern about the safety of the existing mechanical systems controls. See section IX Electrical Systems for suggestions for systems and control upgrades.

RESIDENCE

- Fire alarm system should be tested to confirm that it functions correctly. Upgrade may be required if the fire alarm systems for the residence and visitor center are connected.
- A sprinkler system is not required per code, but is recommended given that the Center is required.
- Ignition-resistant exterior materials required per requirements of CBC Chapter 7a. Full replacement of exterior materials, compliant with Chapter 7a, required by fire marshal for any level of renovation.
- Fire separation distance between Residence and Visitor Center is 25 feet. Per CBC Table 602, neither building is required to have a rated exterior wall.
VIII. CIVIL EVALUATION

SITE DRAINAGE AND UTILITIES

Background and Discussion

DRAINAGE
Both buildings are located on a gentle southwest trending slope. On the uphill side of the Visitor Center (VC), a turf area drains toward an 8-10’ wide bench immediately adjacent to it. (Figures C1-C2) There are numerous area drains within this “flat” bench, some of which are silted in and in some cases higher than grade. (Figures C3-C6) For both buildings, a majority of the roof drains are connected to a subsurface system, a few discharge directly to adjacent grade. (Figures C7-C8) Recent drainage improvements have been installed at the residence, as reported by the maintenance staff and confirmed by visual observation. (Figures C9-C11) The subsurface system discharges either directly or indirectly to Wildcat Creek, across Central Park Dr. from the subject buildings. The maintenance staff reports no historic or current flooding or drainage issues at the VC and none at the residence now, given the new improvements. Water directed from the roof and pavement areas is not treated before flowing to Wildcat Creek. While there are no reported issues with poor drainage or flooding the grading design is not consistent with current design standards. For example, current practice is to provide positive drainage away from buildings, typically at 2% min. for a distance of 10’. In addition, there is no V-ditch at the top of the cut slope above the building to intercept drainage from the hillside above.

WATER
Maintenance staff reports that a wide area of the park, including the subject buildings, are served by a 3” private water line which runs up Central Park Dr. to Canon Dr. E.B.M.U.D. is the service provider and the meter is located near the top of Canon Dr. Staff reports no issues with water pressure. The residence is served from the VC, i.e. it is dependent on water flow to the VC. Two fire hydrants are located in the project area, one to the south and one to the west of the VC. (Figures C12-C13) No flow data for the water supply was provided. There is no existing fire suppression system.

SANITARY SEWER
Sewage from both buildings flows to a lift station located west of the residence. (Figure C14) There the sewage is pumped approximately ¾ mile up Central Park Dr. to a holding tank where it is transferred to a truck and hauled off-site. Staff reports the collection system was reconstructed in 2014 and also serves other facilities within this area of the park.

GAS
Both buildings are served by propane from tanks located west of the residence, within the service yard. (Figure C15) Each building has its own gas service entrance. (Figures C16-C17)

ELECTRICITY
Electric service to both buildings is located underground on Central Park Dr. Staff reports that the transformer is pad mounted and served from a utility pole on Canon Dr. Both buildings and the sewer lift station are served by one meter located at the VC and this meter may also serve other structures in the vicinity. (Figure C18) Staff reports that the existing service is “maxed out” with the new lift station load.
**Recommendations**

**DRAINAGE**
If the existing buildings are remodeled and/or expanded, we recommend the following:
- Map and evaluate the existing storm drain system to determine if all or a portion can be reused.
- Replace or modify the existing system to correct deficiencies such as inadequate slope or sizing and improper inlet placement.
- Replace or modify the existing system to separate stormwater from pervious and impervious surfaces.
- Direct water from impervious surfaces to stormwater treatment facilities.
- Construct a V-ditch to intercept overland flow from the hillside above the buildings.
- Regrade the surface immediately adjacent to the buildings to provide positive drainage away from the buildings.

**WATER**
For either a remodeled/expanded building or new building we recommend the following:
- Perform a flow test of the water line to determine its capacity for fire protection.
- Provide separate domestic water service for each building.
- Provide separate fire service for the education building.
- To determine potential water system upgrades for the project, the District should apply for upgraded water service from EBMUD. The application will trigger design work by EBMUD, who will take into account demand from fire sprinklers, hydrant(s), domestic, and irrigation use. The Fire District would typically require a public water main to serve a public fire hydrant(s) within proximity of the building. The public main would also provide domestic, irrigation and fire sprinkler supply. As a condition of providing public water service, EBMUD would require that the Park District grant them an easement for the public water main. The Park District would construct the new main using EBMUD supplied pipe, which the Park District would be required to purchase.

**SANITARY SEWER**
For either a remodeled/expanded building or new building we recommend the following:
- Review design of existing private sewer system to confirm its adequacy for anticipated load.

**GAS**
For either a remodeled/expanded building or new building we recommend the following:
- Evaluate potential alternatives to propane for heating such as electricity in conjunction with photovoltaics.

**ELECTRICITY**
For either a remodeled/expanded building or new building we recommend the following:
- Engage PG&E regarding anticipated loads and need for upgraded service.

**Future Energy Targets and Renewable Energy Systems**
- Conversion of heating from fossil fuel (propane) to renewable source electric (solar).
- Treatment of runoff from impervious surfaces.
Civil Figures

Figure C-1: Slope behind VC looking east

Figure C-2: Slope behind VC looking north
Figure C-3: Inlet and downspout near VC entry

Figure C-4: Inlet and downspout at VC
Figure C-5: Silted inlet at VC

Figure C-6: Storm drain cleanout
Figure C-7: Downspout at VC

Figure C-8: Downspout at residence
Figure C-9: New drainage improvements at residence

Figure C-10: Extension of drain through fence at residence
Figure C-11: New drainage improvements at residence

Figure C-12: Fire hydrant south of VC
Figure C-13: Fire hydrant west of VC

Figure C-14: Sewer pump station
Figure C-15: Propane tanks

Figure C-16: Gas service at VC
Figure C-17: Gas service at residence

Figure C-18: Electric meter at VC
IX. MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS EVALUATION

Summary
An assessment and examination of the existing mechanical, plumbing, and electrical systems serving the Tilden Environmental Education Center was performed on September 15th, 2016. It was performed with the intent of evaluating the condition of the existing MEP systems with relation to lifespan, code compliance, and overall efficiency/sustainability. Investigation for this report included a site visit conducted by the representatives from Interface Engineering. The following assessment is a description of the existing conditions of the mechanical, plumbing, and electrical systems observed during the walk-through. As-built drawings were limited to the original construction resulting in a limited assessment of the equipment and extent of work potentially required during construction.

Utilities & Energy Usage

CURRENT UTILITY USE
The main electrical service for the Visitor Center (EEC) and Residence is derived from a pad mounted transformer served from a utility pole by PG&E, located up the hill from the building. This is a 600A, 120/240V, 1-phase, 3-wire service. The primary source of heat is propane provided through multiple scheduled deliveries throughout the year. In addition, a solar thermal system has been installed to provide hot water and help trim propane consumption.

ENERGY USE
Most of the existing systems are non-compliant with the latest version of the California Energy Code and other regulating energy efficiency standards. Improper zoning of mechanical systems and use of inefficient lighting fixtures contributes to a significant consumption of energy and can be improved with new systems.
MECHANICAL SYSTEMS

VISITOR CENTER

The facility is conditioned through the use of several different mechanical systems, some of which are original from 1972 and others that were added through renovations in the early 1990’s and 2000’s. There is limited available documentation of the renovations, so assessment was made based on visual inspection. The existing equipment as observed during our site visit consists of the following:

Systems from Original installation in 1972:
• (4) Bohn Heating & Ventilating Units serving various wings of the facility.
• Inline pumps for heating hot water system.
• Relief fan in main lobby.
• Trane Convector in Shop space
• Heating hot water piping and insulation.
• Exhaust fans for staff restrooms and kitchen spaces.
• Ductwork and air terminals.
• Exterior louvers for outside air and exhaust

System Upgrades after 1972:
• Heating-hot water system upgrades in 2003. This included a new Laars Mighty-Therm boiler, controls, piping and flue.
• Heating-only radiant floor for Main Lobby installed in 1992.
• Solar Thermal system on roof consisting of (5) 4’x10’ collectors, hot water storage tank, and associated piping installed in 1992.
• Removal of existing hot-water convectors in restrooms.
• New exhaust fans in public restrooms.
• Disabling of existing Bohn Heating and Ventilating units in several mechanical rooms.
• Overhead ventilation system for Exhibit Hall as a part of the Jewel Lake Exhibit renovation.

RESIDENCE

The detached residence next to the Visitor Center has a combination of systems from the original installation and renovations that took place in the last 1-2 years. All ventilation air is provided through operable windows in each room. Below is a summary of the primary mechanical systems serving the residence:

• Electric resistance base-board heaters are installed underneath the windows in the bedrooms.
• Electric resistance heater in ceiling and wall-mounted exhaust fan in restroom installed during a renovation within the last year to fix a mold growth problem.
• Wood-burning stove in living room. The tenant explained how this was the preferred and primary source of heat in the house.
• Propane-fired wall heater in living room
Items of Concern/Deficiencies

VISITOR CENTER

Based on observation and discussion with the owner, it is apparent that the building is not receiving sufficient outdoor air and there is minimal temperature control of the various zones. The numerous renovations to the building further complicate the operation of the facility due to inadequate information of how the systems are connected.

The operation of heating system is limited to a set of on/off switches in one of the mechanical rooms. There are existing thermostats intended for controlling the various systems, which are no longer operational. The radiant floor and H&V unit serving the offices are interlocked by the use of the on/off switches. If the staff offices require heat, the entire building effectively operates in heating-mode. As a result, the lobby becomes too hot and is uncomfortable for visitors. A roof top relief fan at the top of the lobby and manually-operable vents are intended to relieve rising hot air, however this equipment is not operational and further contributes to the temperature problems in the building. Staff indicates that bat lives in these vents and that they prefer not to disturb them. This issue will need to be addressed in the future.

Air distribution to the various zones in the building is provided by the various Bohn Heating & Ventilating (H&V) units. It was observed that several of the H&V units have been disabled and are not operating all together. With this equipment not operational, the building is receiving inadequate outside air, if any at all. In some of the exhibit spaces, there were no visible air terminals for supply air, further adding to poor ventilation of the building. The H&V unit controlled by the on/off switch is intended to provide outside air. When the switch is turned to the off position, no fresh air is provided to the building contributing to poor indoor air quality.

An evaluation of the primary equipment has been made based on visual inspection and a table published by ASHRAE regarding the service life of mechanical equipment. This table has been included for reference. (See Figure M-1)

HEATING AND VENTILATING UNITS

- The service life of gas-fired boiler equipment is approximately 20 years. The units have reached the end of their service life and from visual inspection appear to be in poor condition or not operating all together. (See Figure M-2)

INLINE PUMPS FOR HEATING WATER SYSTEM

- The service life of pipe-mounted pumps is approximately 10 years. It was unclear if any of the pumps were replaced as a part of the numerous renovations, but from visual inspection they have significant amounts of rust and corrosion. (See Figure M-3)

HEATING HOT WATER PIPING AND INSULATION

- Piping appears to be in fair condition, with no reported leaks. Insulation was not found for many segments of pipe, contributing to a reduction in overall performance of the heating hot water system. The R-value of existing insulation was not able to be determined at the time of visit; further investigation is required to determine if it meets the latest requirements per the California Energy Code. (See Figure M-4)
RELIEF FAN IN MAIN LOBBY
- Owner mentioned this has not been operational for many years and contributes to excessively hot temperatures in the space.

EXHAUST FANS FOR STAFF RESTROOMS AND KITCHEN SPACES
- The service life of fans is approximately 15-25 years. A few of the fans tested during the assessment were loud and not functioning properly, contributing to insufficient or non-existent exhaust airflows in zones that require minimum exhaust rates by ASHRAE.

DUCTWORK AND AIR TERMINALS
- Many air terminals appear to be in fair condition but several have significant dust build up contributing to poor indoor air quality. (See Figure M-5)

EXTERIOR LOUVERS
- Contain significant amounts of dirt accumulation affecting overall performance and indoor air quality. (See Figure M-6)

HEATING-HOT WATER SYSTEM UPGRADES IN 2003
- This included a new boiler, controls, piping and flue. The service life of gas-fired boiler equipment is roughly 25 years, which makes this at half of its service life. According to the manufacturer’s website, this particular model of boiler is no longer available in the USA. Operation of boiler system is limited to wall switch and is not controlled by a thermostat in the building contributing to inadequate temperature control and inefficient energy consumption.

HEATING-ONLY RADIANT FLOOR
- This system was in good condition but no assessment was made on its operation. Through conversation with the owner, it is understood that this system is not controlled independently and is only functional when the entire building heating system is turned on by a set of switches in the mechanical room. A lack of thermostatic control contributes to increased energy consumption and an uncomfortable distribution of heat in the building. Depending on the scope of work, this floor may be capable of re-use but requires further investigation and testing. (See Figure M-7)

SOLAR THERMAL SYSTEM
- The owner mentioned this system was connected to the heating hot water system to aid in pre-heating of the supply water. There are limited documentation available for this system and at the time of visit, system was not in operation and was not verified to be functional. Further investigation is required to determine if this system is adequate for re-use. (See Figure M-8)

OVERHEAD VENTILATION SYSTEM FOR EXHIBIT HALL
- Functionality of system not verified. No visible thermostats were observed at time of visit leading the conclusion that there is insufficient temperature control and outside air provided in this space.
RESIDENCE

The residence is served by a combination of heating systems and has operable windows as a means of providing outside air. The current tenants seemed comfortable with the operation of the existing systems and had minimal complaints. A summary of the condition of the existing systems has been provided below.

- **Electric resistance base-board heaters**: These appear to be from the original construction in 1972 and have reached the end of their service life, which is estimated to be 10 years. *(See Figure M-9)*
- **Electric resistance heater in ceiling and wall-mounted exhaust fan in restroom**: This was recently installed during a renovation that occurred in January 2016 due to mold build up within the shower walls. Both are operated via wall switch and are in good condition.
- **Wood-burning stove in living room**: This was recently replaced and is in good working condition. The tenant explained how this was the preferred and primary source of heat in the house. Per Bay Area Air Quality Management District, no wood-burning stoves are allowed in new construction as of November 2016. Being that this is an existing residence, this may be left in place, but it is contributing to harmful emissions of particulate matter and should be removed.
- **Propane-fired wall heater in living room**: This system which is rarely used and was recommended by tenant to be removed. *(See Figure M-10)*

**Recommendations**

Based on our observations and discussions with the owner, we recommend that the entire mechanical system be demolished and replaced with new as described below. We recommend that the utilities serving the Residence be provided by the Visitor Center and sub-metered to track energy consumption.

VISITOR CENTER

- **Solar Thermal**: Increase quantity of solar thermal collectors on roof to increase overall hot water production and trim propane consumption. In addition, provide additional insulated hot water storage tanks to increase system capacity. By increasing the capacity of this system the entire building heating load can be met on occasion by the hot water produced and stored throughout the day. When the building calls for heat, the stored hot water will be used first, with the propane utilized only to offset any lack of capacity. Further investigation is required to determine how much of the roof is suitable for this installation. Due to the proposed addition of PV panels, space is limited and will have to be considered when sizing the system.
- **Boiler**: Provide new high-efficiency condensing boiler, served by propane. This will only be used in the event the solar thermal system is incapable of meeting the entire heating load of the building.
- **Fan Coil units**: Each wing of the building will require a separate unit. These will provide minimum ventilation airflow and heating. Fans will be equipped with Variable Speed drives to help reduce fan energy consumption to meet varying loads throughout the day. The primary source of heat to be provided through hydronic supply and return piping throughout building.
- **Radiant Floor**: Installed in Lobby and Exhibit spaces that experience a varying occupancy throughout the day. This helps maintain a constant temperature in the space and limits the use of the Fan Coil units for heating. With the use of a radiant slab, a lower supply water temperature is required, making the solar thermal system a primary source of heat.
- **Relief Fan for lobby space**: This fan is essential to relieving the hot air that accumulates at the top of the atrium. It can also aid in a fan-assisted natural ventilation scheme with the use of operable windows and large doors that can be fixed in the open position.
- **General Exhaust**: These fans will serve all restrooms and spaces that contain animal exhibits. Per ASHRAE and the latest California Mechanical Code minimum exhaust rates are required for numerous spaces within this facility that are currently not meeting code.
• Ductwork: Replace all ductwork as it is from the original construction and has reached the end of its service life.

• Heating Hot Water Piping: Replace all piping and insulation in order to meet new building heating loads and serve new equipment.

• Controls and Outside Air: Install new DDC system to provide control for all systems in the building. An example of possible zoning would be the lobby, staff office, exhibit halls, auditorium, and shop all on separate zones. This would help to reduce energy consumption by allowing for more precise control in the occupied/unoccupied portions of the building throughout the day. The thermostats would either control the Fan Coil units or Radiant Slab. In addition, provide CO2 monitoring to help limit energy consumption by reducing outdoor quantity to a minimum in unoccupied zones. In addition, CO2 monitoring also maintains a healthy environment by increasing delivery of outside air to zones that are heavily occupied.

RESIDENCE

• Remove electric resistance wall heaters and replace with hydronic radiators. Provide heating hot water piping from the Solar Thermal system, located in the Visitor Center, as a primary heat source. This will help to limit the use of the wood-stove and will reduce electricity consumption.

• Remove propane wall heater all together as it is not used. The existing propane tank for the residence can be used for the Visitor Center to provide additional storage.

• Sub-meter both electricity and heating hot water consumption in residence. This will help building staff and the tenant to better understand their overall energy usage and will allow for separate billing of the two buildings.
Mechanical Figures

### Owning and Operating Costs

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<td>Steel water-tube</td>
<td>&gt;22</td>
<td>N/A*</td>
<td>20</td>
<td>Steam turbines</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steel fire-tube</td>
<td>25</td>
<td>N/A*</td>
<td>15</td>
<td>Electric motors</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gas or oil-fired</td>
<td>15</td>
<td>N/A*</td>
<td>24</td>
<td>Motor starters</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gas or electric</td>
<td>15</td>
<td>N/A*</td>
<td>15</td>
<td>Electric transformers</td>
<td></td>
</tr>
<tr>
<td>Furnaces</td>
<td></td>
<td>Packaged Chiller</td>
<td>N/A*</td>
<td>20</td>
<td>Reciprocating compressors</td>
<td>N/A*</td>
<td>20</td>
</tr>
<tr>
<td>Gas or oil-fired</td>
<td></td>
<td>Centrifugal</td>
<td>&gt;25</td>
<td>23</td>
<td>Reciprocating</td>
<td>N/A*</td>
<td>20</td>
</tr>
<tr>
<td>Gas or electric</td>
<td></td>
<td>Absorption</td>
<td>N/A*</td>
<td>23</td>
<td>Controls</td>
<td>Pneumatic</td>
<td></td>
</tr>
<tr>
<td>Hot-water or steam</td>
<td></td>
<td>Galvanized metal</td>
<td>&gt;22</td>
<td>20</td>
<td>Controls</td>
<td>N/A*</td>
<td>20</td>
</tr>
<tr>
<td>Radiant heaters</td>
<td></td>
<td>Wood</td>
<td>N/A*</td>
<td>20</td>
<td>Valve actuators</td>
<td>Hydraulic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceramic</td>
<td>N/A*</td>
<td>15</td>
<td>Valves</td>
<td>N/A*</td>
<td>20</td>
</tr>
</tbody>
</table>

* N/A: Not enough data yet in Abramson et al. (2005). Note that data from Akalin (1978) for these categories may be outdated and not statistically relevant. Use these data with caution until enough updated data are accumulated in Abramson et al.

Figure M-1: Comparison of Service Life Estimates as published in 2015 ASHRAE Applications Handbook.
Figure M-2: Heating & Ventilating Unit. This particular unit was disabled and being used for parts to repair other equipment.

Figure M-3: Inline pumps for heating hot water system.
Figure M-4: Uninsulated heating hot water pipe serving convector in Shop.

Figure M-5: Supply Diffuser serving kitchen. Significant accumulation of contaminant build-up observed.
Figure M-6: Outside air intake louver for H&V unit.

Figure M-7: Radiant floor manifold and piping serving Lobby.
Figure M-8: Solar Thermal equipment located in Mechanical Room.

Figure M-9: Electric resistance wall heaters in bedrooms of Residence.
Figure M-10: Propane wall heater in Residence.
X. ELECTRICAL SYSTEMS

VISITOR CENTER

SERVICE AND DISTRIBUTION SYSTEM
The main electrical service for the Visitor Center (EEC) is derived from a pad mounted transformer served from a utility pole by PG&;E, located up the hill from the building. The incoming service provides power to the EEC’s Main Switchboard, via underground feeders and an exterior meter (See Figure E-1) located on the east exterior wall. The Main Switchboard, which is rated at 600 amps, 120/240V, 1 phase, 3 wire, is located in the Storage/Utility room in the east wing of the building. In addition to feeding the EEC, this main switchboard also feeds the Residence, Lodge, Barn, and Pump Station.

The 600-amp Main Switchboard (See Figure E-2) is comprised of an incoming service pull section, a 600A/2P main breaker, and a distribution section. Flooding of the Storage/Utility room where the Main Switchboard is located has been reported by the owner. To mitigate this, a grate (See Figure E-3) has been carved into the floor surrounding the Main Switchboard.

The Main Switchboard provides power to the following loads from the distribution section:

- Panel ‘A’ in the Storage/Utility room via a 200A/2P circuit breaker.
- Panel ‘C’ in the Mechanical room via a 200A/2P circuit breaker.
- Panel ‘R’ in the Residence Utility room via a 125A/2P circuit breaker.
- “Lodge” via a 40A/2P circuit breaker.
- “Pump Station” via a 150A/2P circuit breaker.
- “Little Farm” via a 40A/2P circuit breaker.
- “Maintenance Office” via a 40A/2P circuit breaker.
- “Exit lights” via a 20A/1P circuit breaker.

There is an existing space for Panel ‘B’ on the Main Switchboard. Panel ‘B’ was originally going to be installed in the Nocturnal Animal Hall to serve future loads, but was never installed. A spare 90A/2P breaker in the OFF position and labeled “Temporary Office” is also installed on the Main Switchboard. The pump station was recently installed and connected to the Main Switchboard around 2013. The existing electrical service is currently at its capacity.

LIGHTING SYSTEM
The exterior lighting system illuminates the exterior and entrances to the EEC with wall mounted metal halide lamps (See Figure E-4). The EEC’s exterior lights are controlled via a timeclock located in the Storage/Utility room in the east wing of the building.

The interior lighting system of both the EEC comprises of mostly incandescent-rated fixtures that have been retrofitted with fluorescent lamps. In the EEC, the Main Entrance, Patio Entrance, Lobby, Bathrooms, Utility rooms, and Auditorium are served by recessed incandescent-rated fixtures that have since been retrofitted with fluorescent lamps. The Exhibit Hall, Lobby, Nocturnal Animal Hall, Fire Circle, and Auditorium have track-mounted fluorescent lamp heads. New LED track lights (See Figure E-6) were also observed in the Lobby over a display area. The Offices and Staff area utilize 1’x4’ fluorescent wraparound fixtures.

The controls for most interior lighting are manual switches. There is a knob-style dimmer switch in the EEC’s Auditorium that dims the recessed fluorescent downlights. The office and staff area also uses automatic sensor-switches for occupant sensing function.
FIRE ALARM SYSTEM
Existing strobes, smoke detectors, pull stations, and a fire alarm power supply panel (See Figure E-7) were observed in the field. However, the system has not been recently tested. The owner has expressed that there is no guarantee that the existing fire alarm system is in operating condition.

RESIDENCE

SERVICE AND DISTRIBUTION SYSTEM
The Residence is served from Panel ‘R’ in the Residence Utility Room. Panel ‘R’ is rated at 225A, 120/240V, 1 phase, 3 wire. It is connected to the Main Switchboard in the EEC via a 125A/2P circuit breaker. Panel ‘R’ serves all loads within the residence, including the receptacles, lights, washer and dryer, water heater, and kitchen equipment. Receptacles are located strategically throughout the space to serve the Residence’s electrical needs.

LIGHTING SYSTEM
The exterior lighting system illuminates the exterior and entrances to the Residence with wall mounted halogen lamps (See Figure E-5) and wall mounted metal halide lights similar to those found on the EEC. The Residence’s exterior lights are controlled via manual switches located inside of the Residence.

The interior lighting system of the Residence comprises of mostly incandescent-rated fixtures that have been retrofitted with fluorescent lamps, such as within the Residence living room area, bedrooms, utility rooms, and bathrooms.

The controls for the interior lighting are manual switches. However, there is a knob-style dimmer switch in the living room area of the Residence that controls an incandescent dining room lighting fixture.

FIRE ALARM SYSTEM
The Residence’s fire alarm system is served by smoke detectors located throughout the dwelling areas of the space. The performance and operation of the existing fire alarm system is unknown at this time.

Items of Concern/Deficiencies

VISITOR CENTER

SERVICE AND DISTRIBUTION SYSTEM
The majority of original electrical distribution equipment was installed in 1972 and manufactured by Square D. Although the majority of distribution equipment appears to be in working condition, it is over 40 years old, which is well beyond the manufacturer’s recommended design life.

The existing electrical equipment is grounded via the conduit raceway system and is bonded to the neutral bus. Although this is up to code, this is no longer the industry standard means of grounding.

The available fault current on the Main Switchboard is not field marked per NEC 110.24(A).

Should a new building or complete renovation be considered, the operation of the Barn, Lodge, Pump Station, and Residence fed from the Main Switchboard should also be taken into account. If the Main Switchboard is replaced and taken out of service, this will cause downtime for any loads connected to the Main Switchboard.
If the building renovation or replacement requires a larger electrical load than 600A, 120/240V, 1 phase, 3 wire, then an upgrade to the electrical service will be required. The existing 1 phase service size is typically used only for residential buildings. For a commercial building, a 3 phase service size is recommended to power modern HVAC systems. This could prove to be challenging, as the existing service is located uphill and remote from the service point of entry for the VC. The existing service has limited capacity due to the recent addition of a new sewage ejector pump to the panel. The anticipated load would need to be determined to fully assess the adequacy of the existing panel.

A provisional location for a solar photovoltaic inverter and a labeled space for a 2-pole circuit breaker for a solar photovoltaic installation on the Main Switchboard was not observed. This is part of the mandatory requirement for solar ready buildings with three or fewer stories per California Title 24 section 110.10.

LIGHTING SYSTEM
Although a circuit for “Exit Lights” was observed on the Main Switchboard and Panel ‘A’, no lighting inverter or emergency battery packs were identified. Several of the exit signs have a bug-eye type light to illuminate the exit should there be a power failure. However, given the size of the space, these are not enough to provide the minimum foot-candle required for path of egress. The original plans from 1972 also call out “night lights” to be in operation 24 hours, but no battery packs or inverter were observed to power these. There was no exterior emergency lighting design for an area of refuge on the original 1972 plans.

The original lighting design was intended for incandescent-rated fixtures with incandescent light bulbs. The incandescent-rated fixtures have been retrofitted with fluorescent light bulbs. California Title 24 section 130.0(c)(5) classifies this retrofit as an incandescent only and therefore does not meet Title 24 requirements.

The knob-style dimmers observed in the EEC and Residence do not function properly as a result of the fluorescent light bulb retrofit. The knob-style dimmer in the EEC’s Auditorium dims the lights slightly before flickering and turning off. The knob-style dimmer in the Residence does not control any lights.

California Title 24 130.1(b) requires general lighting in a nonresidential space of any room 100 square feet or larger with a lighting load that is greater than 0.5 watts per square foot to provide multi-level lighting control. This is achieved through step dimming, continuous dimming, or switching alternate lamps within a luminaire. The EEC currently does not comply with this requirement.

California Title 24 130.1(c)(1) requires all indoor lighting for a nonresidential space to be controlled with occupant sensing control or automatic time-switch control capable of automatically shutting OFF lighting when unoccupied. The EEC, except for the office area, currently does not comply with this requirement.

California Title 24 130.1(c)(5) requires offices under 250 square feet and conference rooms of any size to also be controlled by a partial-ON occupant sensor that only switches on 50-70 percent of the controlled lighting power. The alternative to this would be a vacancy sensor that will only switch the lights automatically OFF. Manual ON input is required for the option. The offices in the EEC currently do not comply with this requirement.

California Title 24 section 130.1(d)(2) requires general lighting in a nonresidential space within a daylit zone to be controlled with an automatic daylight control.

FIRE ALARM SYSTEM
The existing fire alarm system has not been tested to confirm that it is operational.
RESIDENCE

SERVICE AND DISTRIBUTION SYSTEM
Panel ‘R’ in the Residence does not meet the code required working space clearance requirement per NEC 110.26. The water heater is within the 3 foot clearance of this panel (See Figure E-8).

Outlets in the Residence are not tamper proof or AFCI rated. NEC 406.12 requires all 120V, 1 phase 15A or 20A outlets in dwelling area kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, sunrooms, bedrooms, and recreation rooms to be tamper proof. NEC 210.12 requires AFCI protected outlets in the areas listed above, as well as in closets, hallways, and laundry areas.

LIGHTING SYSTEM
The original lighting design was intended for incandescent-rated fixtures with incandescent light bulbs. The incandescent-rated fixtures have been retrofitted with fluorescent light bulbs. California Title 24 section 130.0(c)(5) classifies this retrofit as an incandescent only and therefore does not meet Title 24 requirements.

The knob-style dimmers observed in Residence do not function properly. The knob-style dimmer in the Residence currently does not control any lights, although it appears to be intended for the dining room lighting fixture.

The lighting in the Residence does not meet California Title 24 section 150.0(k)(1)(A) high-efficacy requirements. This requires all residential lighting to use high-efficacy luminaires. Title 24 does not consider screw-type compact fluorescent light sources as high-efficacy lighting.

California Title 24 section 150.0(k)(2)(K) requires all lighting (except for hallways and small closets) to be controlled with either a dimmer or vacancy sensor. The Residence currently does not comply with this requirement.

FIRE ALARM SYSTEM
The existing fire alarm system has not been tested to confirm whether it is in operation or not.
Recommendations

VISITOR CENTER

SERVICE AND DISTRIBUTION SYSTEM
In addition to and given the information previously mentioned, the existing building’s electrical distribution system is at the end of its life cycle. The equipment is antiquated and obsolete. Spare parts may not be readily available. If the existing structure is kept in place, then to bring the electrical system to code, up to building efficiency standards, and up to safety and maintenance standards, we recommend replacing the entire electrical system. A new electrical distribution system will allow for energy efficiency, an increase in overall safety and reliability, and an increase in ease of maintenance and operations. The following will be included in the new electrical distribution system:

- A new Main Switchboard ‘MSA’ located in a dedicated main electrical room to increase efficiency of the space and ease of maintenance. The new Main Switchboard will include a ground bus. The Main Switchboard ‘MSA’ will also be rated to accommodates the required electrical service.
- Provisional space for a solar photovoltaic inverter located within the main electrical room and 2-pole circuit breaker on Main Switchboard ‘MSA’ will be included in the design of the electrical distribution system.
- Branch Circuit Panelboards located strategically throughout the EEC. The Branch Circuit Panelboards will have a split-bus to allow for Title 24 required aggregation of loads.

Because the existing Main Switchboard also serves the Barn, Lodge, Pump Station, and Residence, a temporary service or “make-ready” project must be put into place prior to any disconnection of service. This temporary service or “make-ready” project will be designed to minimize the downtime of these loads and keep these loads in operation while the existing Main Switchboard is being replaced.

LIGHTING SYSTEM
In order to meet the California Title 24 lighting systems requirements, a more efficient lighting and controls system must be considered. We recommend a lighting system with the following features to meet California Title 24 requirements and increase the building’s overall efficiency:

- Lighting fixtures for the interior and exterior of the EEC will be replaced with LED luminaires. This significantly decreases the building’s consumption of energy and also offers a significantly longer life-span over the currently installed fluorescent lamps. If track lighting is desired in the new lighting layout, then a track lighting current limiting panel is also required to meet Title 24 requirements.
- Dimmer switches will be installed to provide multi-level lighting control and satisfy Title 24 requirements. This will allow the owner to set the lighting level of each space as desired and also reduce the building’s consumption of energy.
- Occupancy sensors will be installed to automatically turn OFF and ON lighting as required by Title 24. This will reduce the building’s consumption of energy by switching lights OFF when not in use.
- Daylighting sensors will be installed in areas that are lit by natural light from windows and skylights. This will operate to dim lighting in daylighting zones, reducing energy consumption.

A centralized lighting inverter system should be put into place to serve the path of egress emergency lighting. This keeps assigned luminaires in operation if a power failure occurs, allowing for the safe evacuation of occupants.
FIRE ALARM SYSTEM
We recommend replacing the existing fire alarm system to allow for the latest technology, as it was installed with the original construction of the building, over 40 years ago. The new fire alarm system for the VC should include all devices necessary, such as but not limited to, a fire alarm control panel, manual pull stations, strobe lights, and smoke detectors. The new fire alarm system should be laid out to provide coverage per the architectural configuration.

RESIDENCE

SERVICE AND DISTRIBUTION SYSTEM
In order to serve the Residence, we recommend installation of a new Load Center located in the Residence with the required working space clearance. The Load Center will have a sub-meter to allow for separate electrical billing of the Residence. AFCI rated circuit breakers and tamper proof receptacles will be located strategically and in accordance with NEC 210.52 spacing requirements throughout the Residence.

LIGHTING SYSTEM
To meet the Title 24 residential requirements, the lighting system for the interior and exterior of the Residence should be replaced with high-efficacy lighting fixtures. This will also increase the Residence’s overall energy efficiency and will require much less maintenance than the existing fluorescent light bulbs. Title 24 also requires most residential spaces to be equipped with dimmers or vacancy sensors. Dimmers will allow the residents to decrease their energy usage further, as well as provide a greater level of control over the brightness of the lighting fixtures. Vacancy sensors operate to automatically turn OFF lighting when there is no one present. They require manual input to switch the lighting ON. The exterior lighting should be controlled via photo cells and motion sensors to meet Title 24 requirements. Further coordination with the Owner to determine if there are any light pollution reduction requirements based on the close proximity to wildlife.
Electrical Figures

Figure E-1: Exterior Meter

Figure E-2: Main Switchboard
Figure E-3: Utility Room Grate

Figure E-4: Exterior light – Metal Halide
Figure E-5: Exterior Light – Halogen

Figure E-6: Interior Light – LED Track
Figure E-7: Fire Alarm Power Supply Panel

Figure E-8: Panel ‘R’ 3-foot Clearance
Figure E-9: Exit Sign with "Bug-Eye" Light
XI. PLUMBING SYSTEMS

Two single story buildings were investigated; the residence and the Visitor Center. Both buildings were provided with domestic water supply, sanitary and storm drainage and propane gas service. Fire protection piping was not observed on site. There was no reduced pressure backflow prevention device on site for the domestic water.

Systems from Original Installation in 1972

VISITOR CENTER

- The fixtures in the public restrooms were American Standard flush valve water closets, American Standard trough urinal, Speakman single cold water faucets for the top mount American Standard fixture.
- The fixtures in the staff restroom were American Standard tank type toilet for the staff toilet, and American Standard wall hung lavatory with hot/cold water.
- In other areas there was an American Standard stainless steel sink, rough-in for a kitchen sink, rough-ins for cold water sinks in the Auditorium, a Haws electric water cooler, and American Standard service sinks.
- There were (2) water heaters, (1) 20 gallon propane type A.O. Smith KGA-20 and (1) 6 gallon electric type A.O. Smith Pen 6. The electric water heater was wall supported.
- Exterior downspouts were installed for the storm drain.

RESIDENCE

- The residence building was provided with a tank type water closet, integral counter top lavatory, a combination bath/shower, a kitchen sink, and dishwasher.
- The residence was provided with an electric water heater.
- No As-built information for plumbing was provided for the base build.

System Renovations & Observations On-Site

There were several renovations, one occurring in 1991-1992 and one in 2013. According to the owner, the 2013 renovation included upgrading the exterior sewer waste piping.

VISITOR CENTER

- Most of the plumbing fixtures appear to be upgraded from the original base-build.
- In the public space restroom, there are 1.6 gpf wall-hung flush valve type water closets, integral countertop lavatories with manual, single temperature metered faucets, and waterless urinals that exceed the CalGreen requirements of 0.5 gpf. The metered faucets meet the minimum water efficiency for Calgreen as well.
- The staff restrooms are provided with a tank type water closet and an integral hot/cold water lavatory.
- The ADA/Family restroom was provided with a similar flush valve water closet and a wall-hung lavatory with a 0.5 hot/cold water faucet.
- The kitchen sinks appeared to be upgraded from the base-build construction. The single temperature sinks in the Auditorium are 2.0 gpm.
- The service sinks are from the original 1972 construction.
- The electric water cooler appears to have been upgraded; a bottle filler has been added.
• An upgrade from the previous water heaters was observed, (1) 40 gallon propane type A.O Smith FGR 40 249 and (1) 12 gallon electric type Bradford White M12UT6S13. Both water heaters have seismic straps, but are not installed on a housekeeping pad. (See Figures P-3 and P-4)
• The hot water piping from the propane tank was insulated, however, the above ceiling piping was not observed. The hot water piping from the electric water heater was not insulated.
• The original downspouts have PVC below grade piping.
• The Nocturnal Animal Hall was renovated during the 1991 construction; all the floor drains were removed at that time.

RESIDENCE

• It appeared as though a new electric water heater was installed, a Rheem PROE38 S2 RH92. (See Figure P-1)
• It is assumed that the plumbing fixtures were upgraded at some point; the time at which this was done is unknown.
• The water service to the building appeared to be galvanized steel. (See Figure P-2)
• The downspout was retrofitted with what appeared to be conduit. (See Figure P-2)

Items of Concern/Deficiencies

VISITOR CENTER

• The water closets do not meet the minimum water efficiency for CalGreen of 1.28 gpf.
• Several sinks, the lavatory faucets, and the service sinks appear to be old. The public toilets with the exception of the ADA/Family restroom use single cold water temperature water which can be uncomfortable during the fall/winter months. The same can be said of the sinks in the auditorium.
• The ADA/Family restroom lavatory p-trap and hot/cold water stops were not insulated per code and should be brought up to code.
• Both water heaters are 13 years old and are 6-9 years past their service life. They are not installed on a code required housekeeping pad. There are no circulating pumps or hot water loops in the building, with some fixtures being over 25 feet away.
• The hot water piping serving the electric water heater was not insulated; however, the hot water piping serving the propane water heater appeared to be insulated. According to the owner, there is a time delay to receive hot water.
• The condition of the above ceiling piping and below grade piping was not observed and is assumed to be from the original 1972 construction.
• Currently there is no fire sprinkler system installed in the building.

RESIDENCE

• The current fixtures are still in working condition, but appear to be old and water inefficient. The kitchen sink is enameled cast iron and appears to be rusted.
• The resident building’s water heater, Rheem PROE38 S2 RH92 and is only a couple years old. The electric water heater is 95% efficient. Typically water heaters have a service life of 7-10 years.
• The propane service for the building is currently not being used according to the tenants.
• All galvanized steel piping supplying the water service is not up to the current California Plumbing Code 2013.
• Conduit piping used for transferring water can leach, which is harmful to the environment.
Recommendations
The recommendations stated below should be considered for either renovation or new construction.

VISITOR CENTER

- Both the water heaters are past the life expectancy and should be removed; a single condensing propane water heater should be installed with a hot water loop and all the necessary components. Installing a hot water loop will reduce the amount of water that is wasted as users wait for hot water.
- All the fixtures, with the exception of the urinals, and the ADA/Family restroom lavatory faucet should be replaced with higher water efficient fixtures to exceed CalGreen requirements. The public area restrooms and the auditorium should have sensor faucets with tempered water for the lavatories/sinks. Sensor faucets provide users with more comfort and are more hygienic.
- Service sinks should be upgraded to floor mounted fixtures. This relieves staff from more strenuous work.
- Due to the inability to investigate the below grade piping, it is recommended have a video tape survey to determine the conditions of the below grade piping.
- An automatic fire sprinkler system shall be installed per NFP 13.

RESIDENCE

- The fixtures should be upgraded to be new and more water efficient.
- The current electric water heater is only 2 years old and can still be re-used if the building is renovated, however, it is recommended to replace with new for new construction.
- Since the tenants do not use the propane heater, it is recommended to disconnect the propane to the building and re-use the 250 gallon tank as additional storage for the Visitor Center.

Future Energy Targets and Renewable Energy Systems
With the use of the systems described above in mechanical, electrical and plumbing respectively, the overall energy consumption of the facility can be reduced significantly. By increasing the capacity of the solar thermal system, the consumption of propane for heating will be reduced resulting in lower costs for refilling the tanks and fewer emissions from combustion. Providing a new DDC control system will significantly reduce energy consumption by only running equipment when necessary. The control system will allow for zoning of the various wings of the building and effectively let the owner schedule when certain equipment is on based on trend data of usage and temperatures within the zones. It provides the ability for the different systems to communicate with each other provide for the most efficient operation of the building.

In addition, the center could potentially benefit from a Solar-Photovoltaic system located on the roof. However, the proper research, tests, and shading analysis must be performed prior to installation, given the shading present from the surrounding trees in the area.

If the water heater is upgraded as proposed, significant savings can be achieved due to a more efficient system. By replacing the old plumbing fixtures with more water efficient fixtures, water reduction can be over 20%. A basic greywater system for irrigation may produce water savings; however, additional research is required.
**Plumbing Figures**

*Figure P-1: Existing Electric Water Heater serving Residence Building.*

*Figure P-2: Incoming Water Service for Residence Building. Retrofit downspout to conduit piping.*
Figure P-3: Existing Propane Water Heater serving Environmental Education Center.

Figure P-4: Existing Electric Water Heater serving Environmental Education Center.
XI. NEXT STEPS

The District seeks to determine whether the existing EEC should be renovated to meet current District and Staff needs or if a new building would better suit their desires for a Visitors Center. Informational interviews have been scheduled to begin discussions with the District and EEC staff about desired additional functionality and required space sizes for the EEC. S&S will formulate a functional architectural program with this information and then engage the same group in a series of workshops to further define their desires. Two architectural options will be developed; an option which renovates the existing building to accommodate the functional program, and an option which demolishes the existing building and replaces it with a new Center. A cost estimator will assign construction costs to each option.
NEW WORK

EXISTING

4" x 4" RHD. SILL PLATE
2-5/8" anchor bolts
8-4" O.C.

CONC. SLAB REINF. #4
2-3/4" O.C. EACH WAY

EXIST. STUDS

CONC. SLAB

4" MIN.

EXIST. CONC. SURFACE

CLEAN AND WET

SAND BED

MEMBRANE

GRAVEL BASE

COMPACTED SOIL

6" DOWELS x 24" LONG
8-2" O.C.

CONC. (MIN. 3000 PSI)

NOTE:

1/2" GALV. EXPAND BOLTS
8-3/8" O.C. TO ART.
AS DOWELS

ROUGH & KEY

DEPTH OF FIG. MIN.
3'-0" BELOW EXIST.
GRADE AND TO SOLID BEARING

CARCHOT

LIVING ROOM

UTILITY KITCHEN DINING STOR.

LIFTS
APPENDIX C: ASCE 41-13 Structural Evaluation Forms

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA
Building Name: TILDEN ENVIRONMENTAL EDUCATION CENTER
Building Address: 600 Canon Dr, Berkeley, CA 94708
Date: 09/21/16

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA
Building Name: TILDEN ENVIRONMENTAL EDUCATION CENTER
Building Address: 600 Canon Dr, Berkeley, CA 94708
Date: 09/21/16

Gravity Load Structural System: Wood Framed Bearing Walls
Exterior Transverse Walls: Wood Framed Bearing Walls
Exterior Longitudinal Walls: Wood Framed Bearing Walls
Roof Materials/Framing: Plywood on solid sawn framing
Intermediate Floors/Framing: N/A
Ground Floor: Concrete slab on grade
Columns: Wood
Foundation: Spread footings
General Condition of Structure: Good
Levels Below Grade: None
Special Features and Comments: Building is built on a radial grid.

LATERAL-FORCE-RESISTING SYSTEM

Longitudinal
System: Wood structural panel shear walls
Vertical Elements: Wood structural panels
Diaphragms: Plywood
Connections:

Transverse
System: Wood structural panel shear walls
Vertical Elements: Wood structural panels
Diaphragms: Plywood
Connections:

EVALUATION DATA

BSE-IN Spectral Response
Accelarations: $S_{01} = 1.576 \, g$
Soil Factors: Class = D
$F_1 = 1.0$
$F_s = 1.5$

BSE-IE Spectral Response
Accelarations: $S_{02} = 1.576 \, g$
$S_{11} = 0.983 \, g$

Level of Seismicity: High
Performance Level: Life Safety
Building Period: $T = C_t h^{0.75} = 0.02 \times 16.75 \times 0.75 = 0.165 \, s$
Spectral Acceleration: $S_s = S_{21} = 0.983 / 0.165 = 5.96 \leq 1.576 \, g$
Modification Factor: $C_0 C_s G_s = 1.3$

Pseudo Lateral Force: $V = 512 \, kips$
Building Weight: $W = 250 \, kips$

BUILDING CLASSIFICATION:

REQUIRED TIER 1 CHECKLISTS

Basic Configuration Checklist: Yes $W2$
Building Type Structural Checklist: Yes $W2$
Nonstructural Component Checklist: No

FURTHER EVALUATION REQUIREMENT:

Seismic Evaluation and Retrofit of Existing Buildings 437

Tilden Environmental Education Center | Existing Conditions Assessment | December 2, 2016

87
### 16.1.2LS LIFE SAFETY BASIC CONFIGURATION CHECKLIST

#### Low Seismicity

**Building System**

**General**

| C | NC | N/A | U | LOAD PATH: The structure shall contain a complete, well defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1) |
|---|---|---|---|

| C | NC | N/A | U | ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement shall not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2) |
|---|---|---|---|

| C | NC | N/A | U | MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3) |
|---|---|---|---|

**Building Configuration**

| C | NC | N/A | U | WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1) |
|---|---|---|---|

| C | NC | N/A | U | SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2) |
|---|---|---|---|

| C | NC | N/A | U | VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3) |
|---|---|---|---|

| C | NC | N/A | U | GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4) |
|---|---|---|---|

| C | NC | N/A | U | MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5) |
|---|---|---|---|

| C | NC | N/A | U | TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6) |
|---|---|---|---|

#### Moderate Seismicity: Complete the Following Items in Addition to the Items for Low Seismicity.

**Geologic Site Hazards**

| C | NC | N/A | U | LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building’s seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: Sec. 5.4.3.1) |
|---|---|---|---|

| C | NC | N/A | U | SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: Sec. 5.4.3.1) |
|---|---|---|---|

| C | NC | N/A | U | SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: Sec. 5.4.3.1) |
|---|---|---|---|

#### High Seismicity: Complete the Following Items in Addition to the Items for Low and Moderate Seismicity.

**Foundation Configuration**

| C | NC | N/A | U | OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6Sc. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3) |
|---|---|---|---|

| C | NC | N/A | U | TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4) |
|---|---|---|---|
16.3 LS  LIFE SAFETY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

Low and Moderate Seismicity

Lateral Seismic-Force-Resisting System

C  NC  N/A  U  REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C  NC  N/A  U  SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing 1,000 lb/ft
Diagonal sheathing 700 lb/ft
Straight sheathing 100 lb/ft
All other conditions 100 lb/ft

C  NC  N/A  U  STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C  NC  N/A  U  GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

C  NC  N/A  U  NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

C  NC  N/A  U  WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)

C  NC  N/A  U  HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)

C  NC  N/A  U  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

C  NC  N/A  U  OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

Connections

C  NC  N/A  U  WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C  NC  N/A  U  WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

C  NC  N/A  U  GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)
High Seismicity: Complete the Following Items in Addition to the Items for Low and Moderate Seismicity.

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

C NC N/A U DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

C NC N/A U DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)
## APPENDIX C
### SUMMARY DATA SHEET

### BUILDING DATA

- **Building Name:** TILDEN ENVIRONMENTAL EDUCATION CENTER-RESIDENCE
- **Date:** 09/21/16
- **Building Address:** 600 Canon Dr, Berkeley, CA 94708
- **Latitude:** 37.910097
- **Longitude:** -122.265290
- **By:** JML_IDA

### CONSTRUCTION DATA

- **Gravity Load Structural System:** Wood Framed Bearing Walls
- **Exterior Transverse Walls:** Wood Framed Bearing Walls
- **Exterior Longitudinal Walls:** Wood Framed Bearing Walls
- **Roof Materials/Framing:** Plywood on solid sawn framing
- **Intermediate Floors/Framing:** N/A
- **Ground Floor:** Concrete slab on grade
- **Columns:** Wood
- **Foundation:** Spread footings
- **General Condition of Structure:** Good
- **Levels Below Grade?** None
- **Special Features and Comments:**

### LATERAL-FORCE-RESISTING SYSTEM

<table>
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<tr>
<th>System</th>
<th>Longitudinal</th>
<th>Transverse</th>
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<tbody>
<tr>
<td>Vertical Elements</td>
<td>Wood structural panels</td>
<td>Wood structural panels</td>
</tr>
<tr>
<td>Diaphragms</td>
<td>Plywood</td>
<td>Plywood</td>
</tr>
</tbody>
</table>

### EVALUATION DATA

- **BSB-1N Spectral Response Accelerations:**
  - $S_m = 1.579 \text{ g}$
  - $S_{31} = 0.985 \text{ g}$
- **Soil Factors:**
  - Class: D
  - $K_s = 1.0$
  - $F_c = 1.5$
- **BSB-1E Spectral Response Accelerations:**
  - $S_{31} = 1.579 \text{ g}$
  - $S_{31} = 0.985 \text{ g}$
- **Level of Seismicity:** High
- **Performance Level:** Life Safety
- **Building Period:** $T = C \times h \times \gamma_b = 0.02 \times 8 \times 0.085 = 0.085 \text{ s}$
- **Spectral Acceleration:** $S_x = \frac{S_x}{T} = \frac{0.985}{0.085} = 11.61 \text{ g}$
- **Modification Factor:** $C_n C_s C_{31} = 1.3$
- **Pseudo Lateral Force:** $V = C_m C_s S_x W = 56 \text{ kips}$

### BUILDING CLASSIFICATION:

- **REQUIRED TIER 1 CHECKLISTS**
  - Basic Configuration Checklist: [X] Yes
  - Building Type [W]: Structural Checklist: [X] Yes
  - Nonstructural Component Checklist: [ ] Yes

### FURTHER EVALUATION REQUIREMENT:

Seismic Evaluation and Retrofit of Existing Buildings
### 16.2LS LIFE SAFETY STRUCTURAL CHECKLIST FOR BUILDING TYPES W1: WOOD LIGHT FRAMES AND W1A: MULTI-STORY, MULTI-UNIT RESIDENTIAL WOOD FRAME

#### Low and Moderate Seismicity

**Seismic-Force-Resisting System**

<table>
<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>N/A</th>
<th>U</th>
<th>REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)</th>
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</tr>
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<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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</tr>
<tr>
<td></td>
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<td>U</td>
<td>HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)</td>
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<tr>
<td>C</td>
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<td>N/A</td>
<td>U</td>
<td>CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)</td>
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<td>OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)</td>
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</tbody>
</table>

**Connections**

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<thead>
<tr>
<th>C</th>
<th>NC</th>
<th>N/A</th>
<th>U</th>
<th>WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NC</td>
<td>N/A</td>
<td>U</td>
<td>WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)</td>
</tr>
<tr>
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<td>N/A</td>
<td>U</td>
<td>GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)</td>
</tr>
</tbody>
</table>

**High Seismicity: Complete the Following Items in Addition to the Items for Low and Moderate Seismicity.**

**Connections**

| C  | NC | N/A | U | WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3) |
Diaphragms

- **DIAPHRAGM CONTINUITY**: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

- **ROOF CHORD CONTINUITY**: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

- **STRAIGHT SHEATHING**: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

- **SPANS**: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

- **DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS**: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

- **OTHER DIAPHRAGMS**: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)
Budget Estimate Report
Conceptual Design Phase

Tilden Environmental Education Center
Concept Alternatives
Contra Cost County, CA

Report Date:
3/6/17
DRAFT Client Submission Update

Prepared for:
Siegel & Strain Architects

Prepared by:
Robert Borinstein
R. Borinstein Company
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## Concept Phase Estimate

### Executive Summary

**Project:** Tilden Environmental Education Center  
**Client Draft Update**

### Comparative Scheme Option Estimates

#### Renovation Scheme

<table>
<thead>
<tr>
<th>Scheme Description</th>
<th>Probable Amount</th>
<th>Probable Range of Accuracy</th>
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</thead>
<tbody>
<tr>
<td>I. Mobilization, Site Preparation &amp; Clearance</td>
<td>$182,000</td>
<td>$15.19 /gsf</td>
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<tr>
<td>II. Building Demolition</td>
<td>$263,000</td>
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<td>III. Building Structure</td>
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<td>IV. Building Exterior Envelope</td>
<td>$769,000</td>
<td>$64.19 /gsf</td>
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<tr>
<td>V. Interior Buildout &amp; MEPF</td>
<td>$2,633,000</td>
<td>$219.78 /gsf</td>
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<td>VI. Sitework (NIC Utilities)</td>
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<td>VII. Utility Services (NIC Extension Beyond Site)</td>
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**Total Budget Estimate - Renovation Scheme:** $5,976,000 | $498.83 /gsf | $5,378,000 | $8,068,000

#### Replacement Scheme

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<th>Scheme Description</th>
<th>Probable Amount</th>
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<td>II. Building Demolition</td>
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<td>III. Building Structure</td>
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<td>IV. Building Exterior Envelope</td>
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<td>V. Interior Buildout &amp; MEPF</td>
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<td>VI. Sitework (NIC Utilities)</td>
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<td>VII. Utility Services (NIC Extension Beyond Site)</td>
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**Total Budget Estimate - Replacement Scheme:** $7,732,000 | $645.41 /gsf | $6,959,000 | $10,438,000

#### Residence Building Corrective Scope

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<th>Probable Range of Accuracy</th>
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<td>I. Building Demolition</td>
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<td>II. Building Structure</td>
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<td>III. Building Exterior Envelope</td>
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<td>IV. Interior Buildout &amp; MEPF</td>
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<td>V. Sitework (NIC Utilities)</td>
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<td>VI. Utility Services (NIC Extension Beyond Site)</td>
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**Total Budget Estimate - Replacement Scheme:** $220,000 | $237.84 /gsf | $198,000 | $297,000
ANCILLARY FACILITY UPGRADES

I. ACCESSIBLE PATH OF TRAVEL FROM PARKING TO BRIDGE $ 146,000 $ 131,000 $ 197,000
II. UTILITY UPGRADE - WATER SERVICE $ 949,000 $ 854,000 $ 1,281,000

TOTAL BUDGET ESTIMATE - ANCILLARY UPGRADES $ 1,095,000 $ 985,000 $ 1,478,000

ALTERNATES
None

SUMMARY EXCLUSIONS:
1 Costs for interpretive display, signage, or graphics
2 Wayfinding signage program
3 The cost to remove hazardous materials as well as the cost to work in the presence of hazardous materials
4 Bat protection or relocation program
5 FF&E (Furnishings, Fixtures, & Equipment - Non Built-in)
6 Data & telephone equipment
7 Security alarm equipment & devices
8 A/V cabling or equipment
9 Uprising water supply infrastructure as a part of the Base Scope - see Alternates
10 Uprising utility services infrastructure for sewer system, electrical system, or telecom system
11 Utility service connection fees for upgraded water service
12 Phasing work. It is assumed corrective work to the residence will be performed in conjunction with work to the visitor center
13 Planning or permit fees.
14 Bonds if required
15 Project soft costs (A&E Fees, Owner's Management Expenses, Builder's Risk Insurance, Capital Campaign Costs, etc)
16 Project course of construction contingency. (This is not to be confused with the pre-construction design contingency included in the estimate)
17 Inflation escalation - Estimates based on present day cost of construction

Refer to attached estimate detail
### RENOVATION SCHEME

<table>
<thead>
<tr>
<th>Building</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint (Revised Footprint)</td>
<td>11,980 gsf</td>
</tr>
<tr>
<td>Roof Total - Surface Area</td>
<td>12,115 sf (includes 560 sf of skylight)</td>
</tr>
<tr>
<td>Exterior Wall Total - Surface Area</td>
<td>8,400 sf</td>
</tr>
<tr>
<td>Footprint Removal from Existing Building</td>
<td>870 sf (part of Exhibit Hall for new entry)</td>
</tr>
<tr>
<td>Footprint Addition from Existing Building</td>
<td>235 sf (infill room next to conference room)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site - General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacted Site Footprint - NIC Roads &amp; Parking Lot</td>
<td>62,160 sf</td>
</tr>
<tr>
<td>Hardscape &amp; Trails - NIC Roads &amp; Parking Lot</td>
<td>9,775 sf</td>
</tr>
<tr>
<td>Impacted Landscape</td>
<td>52,385 sf</td>
</tr>
<tr>
<td>Impacted Road Footprint</td>
<td>11,560 sf</td>
</tr>
<tr>
<td>Parking Lot Overlay</td>
<td>6,360 sf</td>
</tr>
<tr>
<td>Total Impacted Site (NIC Building Footprint)</td>
<td>80,080 sf</td>
</tr>
<tr>
<td>Perimeter Temporary Fence</td>
<td>1,400 lf</td>
</tr>
</tbody>
</table>

### REPLACEMENT SCHEME

Graphically, the replacement scheme building drawings yields 10,485 gsf. The intent is for the replacement building to provide the same quantity of space as found in the existing building quantified as 11,980 gsf. This represents just under a 15% increase over 10,485 gsf. For the purpose of this conceptual exercise, we have adjusted the estimate for the replacement building scheme to reflect a total gsf of 11,980 and have increased other area quantities accordingly.

<table>
<thead>
<tr>
<th>Building</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint</td>
<td>11,980 gsf</td>
</tr>
<tr>
<td>Main Building</td>
<td>7,490 sf</td>
</tr>
<tr>
<td>Auditorium Building</td>
<td>2,148 sf</td>
</tr>
<tr>
<td>Shop/Classroom Building</td>
<td>2,342 sf</td>
</tr>
<tr>
<td>Roof Total - Surface Area</td>
<td>18,183 sf (over footprint + 4' eave at elevations without covered patios etc)</td>
</tr>
<tr>
<td>Roof Structure at Covered Patios &amp; Walkways</td>
<td>8,157 sf (assume extension of building roof and pitch)</td>
</tr>
<tr>
<td>Exterior Wall Total - Surface Area</td>
<td>12,133 sf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site - General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacted Site Footprint - NIC Roads &amp; Parking Lot</td>
<td>66,845 sf</td>
</tr>
<tr>
<td>Hardscape &amp; Trails - NIC Roads &amp; Parking Lot</td>
<td>12,970 sf</td>
</tr>
<tr>
<td>Impacted Landscape</td>
<td>53,875 sf</td>
</tr>
<tr>
<td>Impacted Road Footprint</td>
<td>13,325 sf</td>
</tr>
<tr>
<td>New Parking Lot</td>
<td>6,360 sf</td>
</tr>
<tr>
<td>Total Impacted Site (NIC Bldg Footprint)</td>
<td>86,530 sf</td>
</tr>
<tr>
<td>Perimeter Temporary Fence</td>
<td>1,400 lf</td>
</tr>
</tbody>
</table>

### RESIDENCE

<table>
<thead>
<tr>
<th>Building</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint</td>
<td>1,495 gsf</td>
</tr>
<tr>
<td>Interior Footprint</td>
<td>925 sf</td>
</tr>
<tr>
<td>Carport Footprint</td>
<td>570 sf</td>
</tr>
<tr>
<td>Roof Total - Surface Area</td>
<td>1,715 sf</td>
</tr>
<tr>
<td>Exterior Wall Total - Surface Area</td>
<td>1,885 sf</td>
</tr>
<tr>
<td>Total Glazing</td>
<td>245 sf</td>
</tr>
</tbody>
</table>
ESTIMATE NOTES, QUALIFICATIONS, AND ASSUMPTIONS

Project: Tilden Environmental Education Center Renovation Conceptual Alternatives Budget Estimate

Location: Contra Costa County, CA

Report Date: 3/6/17

The following is meant to clarify select assumptions used in this conceptual budget estimate and serves as a supplement to the conceptual design drawings upon which this estimate is based. It does not necessarily constitute a complete narrative of all assumptions included in the estimate.

PROJECT DOCUMENTS

This estimate report is based on a combination of design documents including the following:

- Tilden Environmental Education Center renovation conceptual design drawings and narratives transmitted by Siegel & Strain Architects on 1/10/17

- Tilden Environmental Education Center Existing Assessment Report dated 12/2/17 as prepared by Siegel & Strain Architects.

- Proposed EEC Utilities color annotated map dated “Printed December 20, 2016” as prepared by the East Bay Regional Park District

- Tilden EEC Visitor Center Study Utility Service Upgrades scope narrative dated 1/4/2016 unattributed (understood to be prepared by EBRPD).

PROJECT NOTES & QUALIFICATIONS

1. This budget estimate report represents the probable cost of “hard construction” as understood at the conceptual phase and is assembled using empirical market data. Though correspondence with the design team helped clarify a number of issues, the nature of a conceptual estimate involves making a significant quantity of assumptions which may or may not represent the final design or as-built conditions. It is not a guarantee of final project cost, which is dependent upon the development of details for the final design as well as upon the methodology of bid solicitation and the bidding climate at the time of award. A number of project costs are excluded from this estimate and should be reviewed in the Exclusions section below.

2. The estimate is expressed in the best understanding of present day costs and does not include inflation escalation for work performed in future years. Escalation has been highly volatile in the recent past so it is difficult to predict the climate of the industry in the years to come. For the purpose of this exercise, we would recommend the client use an annual escalation factor of 5%, which must be compounded annually, applied to the number of years between now and the anticipated mid-point of construction.

3. The estimate has been summarized in categories of stand-alone scopes to represent zones of work and/or construction assemblies. These breakdowns have been prepared to assist the client in understanding the conceptual scope of work and help facilitate prioritization and phasing exercises if necessary. Though project assemblies are organized as stand-alone work scope,
premiums associated with phasing have not been accounted for in the estimate. Additionally, future changes to the overall scope of the project will likely change the cost of the individual work scope because of the disruption in assumed dependencies between the scopes.

4. The intent of the replacement design is to maintain the same gross square footage of building area found in the existing facility. Quantities derived from the conceptual sketch for the replacement design yielded just under 15% less space than found in the existing. For the purpose of this conceptual analysis, those quantities have been adjusted-up in the estimate by that factor so the areas of the two schemes are comparable.

5. It is assumed the corrective work to the residence will be performed at the same time as work to the visitor center.

6. The estimate provides a separate "Ancillary Facility Upgrade" budget to upgrade the path of travel from the accessible parking spots to the visitor center side of the bridge so the route is brought into compliance with accessibility codes. The items identified in this budget are taken from the first six bullet points under Path of Travel section on page 14 of the Existing Conditions Assessment report. This budget also includes an estimate to add intermediate pipe pickets at the bridge guardrail so the guardrail gaps do not exceed 4”. Subsequently, the budget to upgrade the path of travel between the bridge and the visitor center is included as a part of the Sitework estimate for each scheme.

7. The estimate provides a separate "Ancillary Facility Upgrade" budget to replace the existing 3” water service supply piping with a combination of new service piping comprised of a 6” fire service, a 4” domestic service, and a 4” irrigation service. This replacement work is assumed to be necessary to serve the demands of the facility in both the renovation and replacement schemes. The new piping is assumed to be PVC that ties into the existing water meter located up on Canon Drive, running down Canon Drive in a joint trench, across the facility parking lot, down the traffic circle, across Wildcat Creek on the side of the bridge, and onto the visitor center site. The pipe, where it crosses the bridge, is assumed to be steel pipe since it will likely be exposed. The domestic and fire water pipes are to split at the base of the hill and terminate at the two existing fire hydrants located at either side of the building front. A budget to replace these two fire hydrants is also included. Subsequently, the budget for the new water laterals between the fire hydrants and the buildings, including all associated appurtenances, is estimated as part of the utility cost associated with each scheme.

8. With further study and engineering, it may be found that the new water service from the meter can be provided to the site via a single pipe and then split into domestic, fire, and irrigation on the visitor center site. The water service upgrade scheme estimated in this report and described above, follows the EBRPD directions as contained in the Tilden EEC Visitor Center Study Utility Service Upgrades scope narrative dated 1/4/2016.

9. Upgrades to the sanitary, electrical, and telecom systems serving the site is excluded for now since it has been determined the existing systems are presently adequate to serve either the renovation or replacement schemes. Any upgrades of those systems therefore, are assumed to be discretionary.

EXCLUSIONS

1. New interpretive displays, signage or graphics or the removal, storage and reinstallation of existing.
2. Wayfinding or ID signage. We assume this will be part of the interpretive graphics package. The cost of code required signage is assumed in the estimate.

3. The cost to remove hazardous materials as well as the cost to work in the presence of hazardous materials, which can include bat guano in addition to asbestos, lead, or other hazardous compounds. It is assumed any such cost will be carried in a separate owner budget.

4. Bat protection or relocation program.

5. Furniture, fixtures, and equipment (FF&E) except where specifically called-out. Kitchen equipment is included in this estimate.

6. Data and telephone equipment. The cost of data & telephone cabling is included.

7. Audio-visual cabling or equipment. The cost of conduit raceway anticipated for future installation is assumed in the estimate.

8. Security alarm system.

9. Premiums for phasing the work.

10. Upgrades of the path of travel between the playground, parking lot, and parking lot area restroom building

11. Upgrades to the sanitary, electrical, and telecom systems serving the site is excluded for now since it has been determined the existing systems are adequate to serve either the renovation or replacement schemes. Any upgrades therefore, is assumed to be discretionary.

12. Utility service fees to upgrade service.

13. Owner soft and direct costs. The estimate excludes owner soft and direct costs, such as design and engineering, except for design-build trades, construction management and other consultants, special inspections, capital campaign expenditures, financing, builder’s risk insurance, etc.

14. The cost of performance and payment bonds, if required.

15. Planning fees. As noted above the anticipated cost of a building permit has been factored into the estimate

16. Escalation. An escalation factor has not been provided since the time frame for construction is not clear at this time. The total estimated cost is therefore based on an understanding of present costs. **We would recommend the client use an annual escalation factor of 5%, which must be compounded annually, applied to the number of years between now and the anticipated mid-point of construction.**

17. Owner’s course of construction contingency. The owner’s course of construction contingency is assumed to be carried in a separate owner’s budget. This contingency is different than the design and contractor’s contingencies provided for in the estimate to better anticipate the cost of construction at the time of contract award. The owner’s course of construction contingency should be carried to anticipated change orders during the construction phase generated by unanticipated discoveries or by discretionary changes to the design.
MARK-UP STRUCTURE

1. **Contractor's General Expenses.** A budget has been applied for the general contractor's field expenses and temporary construction required to manage and supervise the project and on-site construction activities. This budget is presently factored as a percentage (12.50%) of the cost of construction.

2. **General Contractor’s Fee.** General contractor's overhead and profit has been included as a combined fee factored as a percentage (10%) of cost.

3. **General Contractor’s Insurance.** A budget for contractor's insurance is applied as a percentage (1%) of cost.

4. **Building Permit Fee.** Excluded as noted in Project Notes and Qualifications above.

5. **Contingency.** A contingency has been factored as a percentage (20%) of cost and has been applied to anticipate the following:
   - Design & estimating contingency to account for the preliminary nature of the design documents.
   - General contractor’s contingency built into the contractor’s price at the time of award.
**RENOVATION SCHEME**

### I. MOBILIZATION, SITE PREPARATION & CLEARANCE

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Mobilization &amp; Proj Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobilization &amp; Temporary facilities</td>
<td>1.00 bgt</td>
<td>20,000.00</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Fencing</td>
<td>1,400.00 ft</td>
<td>7.50</td>
<td>10,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temp erosion control &amp; BMP measures</td>
<td>1.00 bgt</td>
<td>10,000.00</td>
<td>10,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare SWPPP</td>
<td>1.00 bgt</td>
<td>7,500.00</td>
<td>7,500</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Temporary water service</td>
<td>1.00 bgt</td>
<td>1,500.00</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temporary electrical service</td>
<td>1.00 bgt</td>
<td>10,000.00</td>
<td>10,000</td>
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<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td><strong>59,500</strong></td>
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**G1010 Site Clearing**

<table>
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<th>Code</th>
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<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clear &amp; grubb landscaping</td>
<td>63,000.00 sf</td>
<td>0.10</td>
<td>6,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove large trees at east side of bldg - incl stump removal</td>
<td>4.00 ea</td>
<td>1,500.00</td>
<td>6,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove large trees at road intersection - incl stump removal</td>
<td>2.00 ea</td>
<td>1,500.00</td>
<td>3,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove medium trees at east side of bldg - incl stump remov</td>
<td>4.00 ea</td>
<td>500.00</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Haul and dispose</td>
<td>500.00 cy</td>
<td>20.00</td>
<td>10,000</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Subtotal</strong></td>
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<td></td>
<td><strong>27,300</strong></td>
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**G1020 Site Elements Demolition and Relocations**

<table>
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<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remove entry concrete</td>
<td>950.00 sf</td>
<td>2.00</td>
<td>1,900</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Remove entry wood platform</td>
<td>360.00 sf</td>
<td>0.75</td>
<td>270</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Remove entry walkway concrete</td>
<td>1,380.00 sf</td>
<td>2.00</td>
<td>2,760</td>
<td></td>
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<tr>
<td></td>
<td>Remove pathway concrete around building</td>
<td>3,245.00 sf</td>
<td>2.00</td>
<td>6,490</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove back porch (post tension slab) &amp; structure underneath</td>
<td>900.00 sf</td>
<td>6.00</td>
<td>5,400</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Demo mud deck &amp; ramp concrete</td>
<td>215.00 sf</td>
<td>4.00</td>
<td>860</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Misc site elements demo</td>
<td>1.00 bgt</td>
<td>1,500.00</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove asphalt at road to Little Farm - section to be regraded</td>
<td>5,700.00 sf</td>
<td>1.35</td>
<td>7,695</td>
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<td></td>
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<tr>
<td></td>
<td>Demo at Jewel Lake Road in conjunction with rework - see Sitework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demo at parking lot in conjunction with rework - see Sitework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Haul and dispose</td>
<td>150.00 cy</td>
<td>50.00</td>
<td>7,500</td>
<td></td>
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<td></td>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td><strong>34,375</strong></td>
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**G1030 Site Earthwork**

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Site grading - see Sitework</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL: I. MOBILIZATION, SITE PREPARATION & CLEARANCE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Net Total Incl Mark-up: $121,175

$10.11 /gsf bldg

Net Total Incl Mark-up: $181,996

**II. BUILDING DEMOLITION**

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotals</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2010</td>
<td>Building Elements Demolition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interior demolition - complete back to structure</td>
<td>12,600.00 sf</td>
<td>5.00</td>
<td>63,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strip siding - remove doors &amp; windows</td>
<td>8,400.00 sf</td>
<td>1.50</td>
<td>12,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strip roof</td>
<td>12,000.00 sf</td>
<td>0.65</td>
<td>7,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove skylight</td>
<td>560.00 sf</td>
<td>8.00</td>
<td>4,480</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Item Description</td>
<td>Quantity</td>
<td>Unit Cost</td>
<td>Ext Cost</td>
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<tr>
<td>------</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cut/Remov Exhibit Hall wall structure for new entry</td>
<td>870.00 sf</td>
<td>5.00</td>
<td>4,350</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temporary shoring - Exhibit Hall roof</td>
<td>40.00 fl</td>
<td>50.00</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cut/Remove concrete platform at center lobby &amp; fire circle room</td>
<td>2,135.00 sf</td>
<td>12.00</td>
<td>25,620</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temporary shoring - center lobby roof</td>
<td>1.00 bgt</td>
<td>15,000.00</td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Misc demo at fire circle room &amp; adjacent for small addition</td>
<td>1.00 bgt</td>
<td>5,000.00</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excavate soil under raised platform - handwork</td>
<td>200.00 cy</td>
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**III. BUILDING STRUCTURE**

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<td>Standard Foundations</td>
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<td>Reconstruct foundation for lobby walls &amp; slab</td>
<td>2,135.00 sf</td>
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<td>Reconstruct foundation for infill structure btwn conf &amp; workrm</td>
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<td>Foundation for new mud porch roof</td>
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<td>A1030</td>
<td>Slab on Grade</td>
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<td>SOG complete at lobby replacement</td>
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<td>SOG for infill structure btwn conf &amp; workroom</td>
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<td>Foam infill &amp; slab at conference room (fire circle room)</td>
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<td>Foam infill &amp; slab at workroom</td>
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<td>Reconstruct bearing walls at lobby</td>
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<td>Reconstruct exterior bearing structure at entry canopy</td>
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<td>Seismic Bracing</td>
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<td>Seismic bracing - wall shearing &amp; moment frames</td>
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**IV. BUILDING EXTERIOR ENVELOPE**

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<td>Thermal insulation</td>
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<td>Vapor barrier, peel &amp; stick, &amp; flashing</td>
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<td>Wood siding</td>
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## Renovation Scheme

### Estimate Detail

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<th>Totals</th>
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<tr>
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<td><strong>Assembly</strong></td>
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<td>Storefront - new entry</td>
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<td>Storefront - porch entry</td>
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<td>Storefront - porch entry</td>
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<td>pair</td>
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<td>Garage - overhead door (10'x10')</td>
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<td>Rigid insulation</td>
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<td>Roof - asphalt shingle complete - 5:12</td>
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<td>Roof - membrane - flat &amp; low slope (over interior)</td>
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<td>Roof - membrane - entry and mud porch roofs</td>
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<td>7,400</td>
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<td>Roof edge coping - building roof</td>
<td>1,020.00</td>
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<td>25,500</td>
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<td>Roof edge coping - porch roofs</td>
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<td>Inside corner &amp; misc flashing</td>
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<td>Leader heads &amp; downspouts</td>
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<td>Skylights w/operable vents</td>
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### V. Interior Buildout & MEPF

#### C10 Interior Construction

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<td>Interior partitions</td>
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<td>Ceilings</td>
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<td>Int doors - exit assembly spaces - pair</td>
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<td>Int doors - single</td>
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#### C30 Interior Finishes

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<td>Lobby, Exhibit, Info/Store finishes</td>
<td>5,100.00</td>
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<td>Restroom finishes</td>
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<td>Auditorium finishes</td>
<td>1,370.00</td>
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<td>Classroom &amp; conference rooms</td>
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<td>Workroom</td>
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<td>Kitchen &amp; animal</td>
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<td>Storage/mech rooms</td>
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<td>Shop - minimal</td>
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#### C3050 Interior Fabrications

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<td>Animal cabinets</td>
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<td>Store cabinets &amp; counter</td>
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<td>Auditorium cabinets</td>
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Net Total Incl Mark-up: 769,472
## RENOVATION SCHEME

### Estimate Detail

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<td>Classroom &amp; conference room white boards etc</td>
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<td>Solar thermal collector system complete</td>
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<td>Variable speed fan coils &amp; piping</td>
<td>6.00 ea</td>
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<td>DDC control system</td>
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<td>ASR, distribution piping, &amp; heads complete</td>
<td>11,980 gsf</td>
<td>8.00</td>
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<td>Connect to new water line at 5' from building</td>
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<td>DDCV, FDC, &amp; PIV - see Utility Services</td>
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<td>Emergency lighting circuit on battery back-up</td>
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<td>A/V conduit - infrastructure - NIC cabling &amp; equipment</td>
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**TOTAL:** V. INTERIOR BUILDOUT & MEPF

|          | 1,753,020 | **$146.33 /gsf bldg** |

**Net Total Incl Mark-up**

|          | 2,632,912 |

---

## VI. SITEWORK (NIC UTILITIES)

### G1010 Site Clearing
- See Mobilization & Site Preparation
- **Subtotal**

### G1020 Site Elements Demolition and Relocations
- See Mobilization & Site Preparation
- **Subtotal**

### G1030 Site Earthwork
## RENOVATION SCHEME

### Estimate Detail

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<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Trade Ext</th>
<th>Assembly Ext</th>
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<td>Misc hand grade - clear around building</td>
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<td>Correct grades on road to Little Farm - prep for tread</td>
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<td>Road to Little Farm - Park Tread surfacing (8&quot; section)</td>
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<td>Road to Jewel Lake - overlay asphalt (1.5&quot;)</td>
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<td>Staff parking - overlay asphalt (1.5&quot;)</td>
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<td>Front porch paving - concrete</td>
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<td>Foot trail b'tween front porch &amp; parking - Park Tread (6&quot; section)</td>
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<td>Foot trail Jewel Lake Road to front - rustic with wood steps</td>
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<td>Mud porch - raised with ramp and stairs</td>
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<td>Back porch below amphitheater</td>
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<td>Foot trail - behind amphitheater - Park Tread (6&quot; section)</td>
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<td>Entry bridge/boardwalk - abutments, wood decking, &amp; rails</td>
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<td>Conc retain/seat wall at road intersect (5'+18&quot; seat - curved)</td>
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<td>Conc seat wall at bridge (18&quot;x18&quot;)</td>
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<td>Conc seat wall at entry porch (18&quot;x18&quot;)</td>
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<td>Concrete terrace walls at amphitheater</td>
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<td>60,000</td>
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<td>Concrete steps at terrace</td>
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<td>Railing at road intersection retaining wall</td>
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<td>250.00</td>
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<td>Railing at amphitheater stairs</td>
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<td>Fence and gate lift station</td>
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<td>Prep &amp; amend soil</td>
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<td>New trees - 36&quot; box</td>
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<td>800.00</td>
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<td>Wetland planting in drainage swale</td>
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<td>Meadow grasses in front</td>
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<td>4,500</td>
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<td>Screen planting at staff parking/ lift station</td>
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Net Total Incl Mark-up:

- $60.90 /gsf bldg
- $9.11 /gsf impacted site
- $1,095,730
### VII. UTILITY SERVICES (NIC EXTENSION BEYOND SITE)

G3010 Water Supply

- Joint trench for water service
  - New domestic water service - incl tie-in to main at hydrant 85.00 if 65.00 5,525
  - New fire water service - incl tie-in to main at hydrant 85.00 if 65.00 5,525
  - Relocate fire hydrant to accommodate grading 1.00 ea 1,500.00 1,500
  - Fire water DDCV (backflow) assembly 1.00 bgt 7,500.00 7,500
  - Fire Dept connection / PIV 1.00 bgt 5,000.00 5,000
- Water service meter fees - excluded - separate owner budget

Subtotal 25,050

G3020 Sanitary Sewer

- No underground changes this scheme

Subtotal -

G3030 Storm Sewer

- Bioswales complete 800.00 sf 25.00 20,000
- Foundation drains at front 300.00 if 20.00 6,000
- Foundation drains at back 390.00 if 20.00 7,800
- Exfiltration - foundation drains at bioswales 2.00 loc 750.00 1,500
- Area drains at parking lot 1.00 bgt 2,500.00 2,500
- Culvert from drainage swale to creek 1.00 bgt 7,500.00 7,500

Subtotal 45,300

G3060 Fuel Distribution

- No changes to propane distribution

Subtotal -

G4010 Electric Distribution

- No change to electrical feed to building

Subtotal -

G4030 Site Communications & Security

- No change to data feed to building

Subtotal -

TOTAL: VII. UTILITY SERVICES (NIC EXTENSION BEYOND SITE) 70,350 $5.87 /gsf bldg

Net Total Incl Mark-up 105,661

---

**Raw Cost of Work**

- General Expenses (Incl 2.5% for District Reqs) 12.50% 497,290
- Contractor's Fee (OH & Profit) 10.00% 447,561
- Contractor Insurance 1.00% 56,124
- Building Permit 0.00% -
- Contingency 20.00% 995,858
- Cost Escalation - Excluded 0.00% -

**Total Budget Estimate - Hard Construction**

1,996,832 5,975,149
**CONCEPT PHASE ESTIMATE**

**Project:** Tilden Environmental Education Center  
Comparative Scheme Option Estimates

**Design Docs:** EB Parks: Tilden Visitor Center

**Document Date:** 12/14/2016

**Bldg Footprint:** 11,980 gsf  
**Total Site Footprint:** 86,500 sf

**REPLACEMENT SCHEME**

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<th>Estimate Detail</th>
<th>code</th>
<th>item description</th>
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<td>50 Mobilization &amp; Proj Preparation</td>
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**II. BUILDING DEMOLITION**

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**Replace - Detail**
## REPLACEMENT SCHEME

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### III. BUILDING STRUCTURE

#### A1010 Standard Foundations
- Building foundations: 11,980.00 sf @ $18.00 = $215,640
- Exterior canopy foundations: 8,150.00 sf @ $10.00 = $81,500
- **Subtotal**: $297,140

#### A1030 Slab on Grade
- SOG building interiors: 11,980.00 sf @ $8.00 = $95,840
- Exterior slab surfaces - see Sitework
- **Subtotal**: $95,840

#### B1020 Roof Construction
- Above grade structure - enclosed building: 11,980.00 sf @ $50.00 = $599,000
- Premium cost at high Exhibit space: 3,685.00 sf @ $15.00 = $55,275
- Canopy structure at exterior walkways: 8,150.00 sf @ $35.00 = $285,250
- **Subtotal**: $939,525

### III. BUILDING STRUCTURE

- **Subtotal**: $1,332,505
- **Net Total Incl Mark-up**: $2,001,328

### IV. BUILDING EXTERIOR ENVELOPE

#### B20 Exterior Enclosure
- Scaffolding: 13,685.00 csf @ $1.50 = $20,528
- Thermal insulation: 9,290.00 sfwl @ $1.50 = $13,935
- Vapor barrier, peel & stick, & flashing: 9,290.00 sfwl @ $3.00 = $27,870
- Wood siding: 9,290.00 sfwl @ $10.00 = $92,900
- Storefront - front Exhibit wall - 22' + high peaked: 1,200.00 sfwl @ $125.00 = $150,000
- Storefront - rear Exhibit wall - high peaked (NIC sliders): 850.00 sfwl @ $80.00 = $68,000
- Storefront - rear Exhibit slider glass doors: 450.00 sfwl @ $250.00 = $112,500
- Storefront - lower height next to entry doors: 250.00 sfwl @ $100.00 = $25,000
- Entry vestibule: 375.00 sfwl @ $50.00 = $18,750
- Storefront - main entry doors: 2.00 pair @ $7,500.00 = $15,000
- Large exit doors from Exhibit space: 2.00 pair @ $6,500.00 = $13,000
- Doors - Auditorium exit: 2.00 pair @ $6,000.00 = $12,000
- Doors - Auditorium exit with sidelites: 1.00 ea @ $3,500.00 = $3,500
- Doors - misc exit: 7.00 ea @ $2,400.00 = $16,800
- Garage - overhead door (10'x10') sides: 1.00 ea @ $2,000.00 = $2,000
- Windows: 22.00 ea @ $1,000.00 = $22,000
- **Subtotal**: $613,783

#### B30 Roofing
- Rigid insulation: 12,750.00 sf @ $2.50 = $31,875
- Roof - metal complete over building - 4:12: 12,750.00 sf @ $13.00 = $165,750
- Roof - metal complete over canopy - 4:12: 12,750.00 sf @ $13.00 = $165,750
- Roof - membrane - entry and mud porch roofs: 1,690.00 sf @ $5.00 = $8,450
- Leader heads and downsputs: 12.00 loc @ $650.00 = $7,800
- **Subtotal**: $57,790
## REPLACEMENT SCHEME

### Estimate Detail

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<th>subtotals</th>
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### V. INTERIOR BUILDOUT & MEFP

#### C10 Interior Construction

- Interior partitions: 11,980.00 gsf, $12.00, 143,760
- Ceilings: 11,980.00 sf, $15.00, 179,700
- Int doors - single: 11.00 ea, 1,850.00, 20,350

Subtotal: 343,810

- Net Total: 345,810

#### C30 Interior Finishes

- Lobby, Exhibit, Info/Store finishes: 3,685.00 sf, $15.00, 55,275
- Restroom finishes: 770.00 sf, $30.00, 23,100
- Auditorium finishes: 1,930.00 sf, $15.00, 28,950
- Classroom & conference rooms: 1,585.00 sf, $10.00, 15,850
- Workroom: 1,770.00 sf, $10.00, 17,700
- Kitchen & animal: 800.00 sf, $10.00, 8,000
- Storage/mech rooms: 550.00 sf, $7.50, 4,125
- Shop - minimal: 795.00 sf, $3.00, 2,385

Subtotal: 155,385

Net Total: 155,385

#### C3050 Interior Fabrications

- Toilet partitions: 8.00 ea, 1,800.00, 14,400
- Toilet accessories - public restrooms: 2.00 loc, 5,000.00, 10,000
- Toilet accessories - staff restrooms: 2.00 loc, 1,000.00, 2,000
- Lavatories - public restrooms: 2.00 loc, 1,200.00, 2,400
- Kitchen cabinets & appliances: 1.00 bgt, 25,000.00, 25,000
- Animal cabinets: 1.00 bgt, 25,000.00, 25,000
- Reception/store cabinets & counter: 1.00 bgt, 50,000.00, 50,000
- Auditorium cabinets: 1.00 bgt, 15,000.00, 15,000
- Workroom stations: 6.00 loc, 4,000.00, 24,000
- Classroom & conference room white boards etc: 2.00 loc, 1,000.00, 2,000
- Code signage (NIC wayfinding or interp signage): 1.00 bgt, 2,000.00, 2,000

Subtotal: 171,800

Net Total: 171,800

#### D20 Plumbing

- Fixtures: 25.00 ea, 3,500.00, 87,500
- Water heater w/circ pump and piping: 1.00 bgt, 15,000.00, 15,000
- Water service line between main building and shop bldg: 40.00 lf, 25.00, 1,000
- Connect to new water line at 5’ from building: 1.00 bgt, 1,000.00, 1,000

Subtotal: 104,500

Net Total: 104,500

#### D30 HVAC

- Gas fired boiler: 1.00 bgt, 35,000.00, 35,000
- Solar thermal collector system complete: 1.00 bgt, 30,000.00, 30,000
- Variable speed fan coils & piping: 6.00 ea, 3,500.00, 21,000
- Hydronic floor heating complete: 3,515.00 sf, $14.00, 49,210
- Hydronic piping underslab between buildings: 100.00 if, 40.00, 4,000
- Ducting: 11,980.00 sf, $15.00, 179,700
- Relief fan in lobby: 1.00 bgt, 2,500.00, 2,500
- Restroom exhaust: 4.00 ea, 750.00, 3,000
- Animal room exhaust: 1.00 ea, 750.00, 750
- Kitchen exhaust: 1.00 ea, 750.00, 750
### REPLACEMENT SCHEME

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### VI. SITWORK (NIC UTILITIES)

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<td>Parking Lots</td>
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<td>New parking lot - asphalt</td>
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<td>Pedestrian Paving</td>
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<td></td>
<td>Front porch paving - concrete</td>
<td>2,450</td>
<td>sf</td>
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## REPLACEMENT SCHEME

### Estimate Detail

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<th>totals</th>
<th>quals &amp; assumptions</th>
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<tr>
<td></td>
<td>Pass through and center court paving - concrete</td>
<td>5,100 sf</td>
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<td></td>
<td>Foot trail - entry walks - Park Tread (6&quot; section)</td>
<td>1,565 sf</td>
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<td>Foot trail - front porch, parking, road - Park Tread (6&quot; section)</td>
<td>1,170 sf</td>
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<td>14,040</td>
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<td></td>
<td>Back porch below amphitheater</td>
<td>950 sf</td>
<td>12.00</td>
<td>11,400</td>
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<td>Foot trail - behind amphitheater - Park Tread (6&quot; section)</td>
<td>1,725 sf</td>
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#### G2040 Site Development

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<th>quals &amp; assumptions</th>
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<tbody>
<tr>
<td></td>
<td>Conc seat wall at road intersect (18&quot; x 18&quot; seat - curved)</td>
<td>110 lf</td>
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<td></td>
<td>Conc seat wall at entry porch (18&quot;x18&quot;)</td>
<td>75 lf</td>
<td>200.00</td>
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<tr>
<td></td>
<td>Conc seat wall above amphitheater (18&quot;x18&quot;)</td>
<td>50 lf</td>
<td>200.00</td>
<td>10,000</td>
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<tr>
<td></td>
<td>Concrete terrace walls at amphitheater</td>
<td>170 lf</td>
<td>300.00</td>
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<td>Concrete steps at terrace</td>
<td>75 lf</td>
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<tr>
<td></td>
<td>Railing at amphitheater stairs</td>
<td>48 lf</td>
<td>150.00</td>
<td>7,200</td>
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<tr>
<td></td>
<td>Fence and gate at parking lot &amp; lift station</td>
<td>400 lf</td>
<td>90.00</td>
<td>36,000</td>
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#### G2050 Landscaping

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<th>totals</th>
<th>quals &amp; assumptions</th>
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<tbody>
<tr>
<td></td>
<td>Irrigation modify &amp; replace</td>
<td>54,000 sf</td>
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<td>Prep &amp; amend soil</td>
<td>54,000 sf</td>
<td>0.75</td>
<td>40,500</td>
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<tr>
<td></td>
<td>New trees - 36&quot; box</td>
<td>15 ea</td>
<td>800.00</td>
<td>12,000</td>
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<tr>
<td></td>
<td>Planter landscaping - native</td>
<td>880 sf</td>
<td>5.00</td>
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<tr>
<td></td>
<td>Meadow grasses in front</td>
<td>20,000 sf</td>
<td>0.25</td>
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<tr>
<td></td>
<td>Meadow grasses in back</td>
<td>28,600 sf</td>
<td>0.25</td>
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<tr>
<td></td>
<td>Meadow grasses around parking lot</td>
<td>4,270 sf</td>
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<td>Screen planting at staff parking / lift station</td>
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**TOTAL: VI. SITWORK (NIC UTILITIES) 670,778**

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<td>G3010 Water Supply</td>
<td>Joint trench for water service</td>
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<tr>
<td></td>
<td>New domestic water service - incl tie-in to main at hydrant</td>
<td>85.00 lf</td>
<td>65.00</td>
<td>5,525</td>
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<td>New fire water service - incl tie-in to main at hydrant</td>
<td>85.00 lf</td>
<td>65.00</td>
<td>5,525</td>
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<td>Relocate fire hydrant to accommodate grading</td>
<td>1.00 ea</td>
<td>1,500.00</td>
<td>1,500</td>
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<td></td>
<td>Fire water DDCV (backflow) assembly</td>
<td>1.00 bgt</td>
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<td>Fire Dept connection / PIV</td>
<td>1.00 bgt</td>
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<td>5,000</td>
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<td></td>
<td>Water service meter fees - excluded - separate owner budget</td>
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### VII. UTILITY SERVICES (NIC EXTENSION BEYOND SITE)

#### G3020 Sanitary Sewer

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<th>totals</th>
<th>quals &amp; assumptions</th>
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<tr>
<td></td>
<td>Sewer line from two buildings - connect to existing lateral</td>
<td>115.00 lf</td>
<td>120.00</td>
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#### G3030 Storm Sewer

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<th>totals</th>
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<tr>
<td></td>
<td>Bioswales complete</td>
<td>800.00 sf</td>
<td>25.00</td>
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<tr>
<td></td>
<td>Foundation drains at front</td>
<td>400.00 lf</td>
<td>20.00</td>
<td>8,000</td>
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<tr>
<td></td>
<td>Foundation drains at back</td>
<td>400.00 lf</td>
<td>20.00</td>
<td>8,000</td>
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<td></td>
<td>Exfiltration - foundation drains at bioswales</td>
<td>2.00 loc</td>
<td>750.00</td>
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<td>Trench drain at back porch</td>
<td>45.00 lf</td>
<td>75.00</td>
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<td>Area drains at parking lot</td>
<td>1.00 bgt</td>
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<td></td>
<td>Culvert from drainage swale to creek</td>
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<td>7,500.00</td>
<td>7,500</td>
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#### G3060 Fuel Distribution

Net Total Incl Mark-up 1,007,460

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<th>quals &amp; assumptions</th>
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## REPLACEMENT SCHEME

### Estimate Detail

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<td>New house keeping pads for propane tanks</td>
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<td>Relocate propane tanks</td>
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<td>Propane piping to buildings</td>
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<td>New underground feed to building</td>
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**TOTAL: VII. UTILITY SERVICES (NIC EXTENSION BEYOND SITE)**  

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Net Total Incl Mark-up: 153,535

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**Total Budget Estimate - Hard Construction**  

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<th>2,583,629</th>
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</tbody>
</table>

- General Expenses (Incl 2.5% for District Reqs)  
  - Contractor's Fee (OH & Profit)  
  - Contractor Insurance  
  - Building Permit  
  - Contingency  
  - Cost Escalation - Excluded  

- Budget by owner
- present cost of const

**Replace - Detail**
CONCEPT PHASE ESTIMATE

Project: Tilden Environmental Education Center
Comparative Scheme Option Estimates

Est by: RMB
Est Date: 3/6/17

Design Docs: EB Parks: Tilden Visitor Center
Document Date: 12/14/2016

Bldg Footprint: 925 gsft

RESIDENCE BUILDING CORRECTIVE SCOPE

<table>
<thead>
<tr>
<th>Estimate Detail</th>
<th>code</th>
<th>item description</th>
<th>quantity</th>
<th>unit cost</th>
<th>ext</th>
<th>subtotals</th>
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<tbody>
<tr>
<td>I. BUILDING DEMOLITION</td>
<td>F2010</td>
<td>Building Elements Demolition</td>
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<tr>
<td>Install interior finish protection</td>
<td>1.00</td>
<td>bgt</td>
<td>1,500.00</td>
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<td>Misc demo of int walls &amp; ceiling for seismic &amp; MEP work</td>
<td>1.00</td>
<td>bgt</td>
<td>5,000.00</td>
<td>5,000</td>
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<tr>
<td>Strip siding - remove windows</td>
<td>1,885.00</td>
<td>sf</td>
<td>1.50</td>
<td>2,828</td>
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<td></td>
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<tr>
<td>Strip roof</td>
<td>1,710.00</td>
<td>sf</td>
<td>0.65</td>
<td>1,112</td>
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<td>Remove baseboard and wall heaters</td>
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<td>500.00</td>
<td>500</td>
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<td>Haul and dispose</td>
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<td>bgt</td>
<td>1,000.00</td>
<td>1,000</td>
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<td>Subtotal</td>
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<td>F2020</td>
<td>Hazardous Components Abatement</td>
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<td>TOTAL: I. BUILDING DEMOLITION</td>
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Net Total Incl Mark-up | 11,939 | $12.91 /gsf bldg |

II. BUILDING STRUCTURE

<table>
<thead>
<tr>
<th>code</th>
<th>B1540</th>
<th>Vertical Reconstruction</th>
<th>Budget for dryrot &amp; misc repair</th>
<th>1,885.00</th>
<th>sfwl</th>
<th>2.00</th>
<th>3,770</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B1550</td>
<td>Horizontal Reconstruction</td>
<td>Budget for dryrot &amp; misc repair</td>
<td>1,715</td>
<td>sf</td>
<td>2.00</td>
<td>3,430</td>
<td>Subtotal</td>
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<tr>
<td></td>
<td>B1560</td>
<td>Seismic Bracing</td>
<td>Seismic bracing - wall shear - house structure</td>
<td>925</td>
<td>sf</td>
<td>15.00</td>
<td>13,875</td>
<td>Subtotal</td>
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<td></td>
<td></td>
<td></td>
<td>Seismic bracing - wall shearing &amp; moment frames - carport</td>
<td>570</td>
<td>sf</td>
<td>20.00</td>
<td>11,400</td>
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</tbody>
</table>

TOTAL: II. BUILDING STRUCTURE | 32,475 | $35.11 /gsf bldg |

Net Total Incl Mark-up | 48,775 |

III. BUILDING EXTERIOR ENVELOPE

<table>
<thead>
<tr>
<th>code</th>
<th>B20</th>
<th>Exterior Enclosure</th>
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<th>sfwl</th>
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<tbody>
<tr>
<td></td>
<td>Thermal insulation</td>
<td>1,885.00</td>
<td>sfwl</td>
<td>1.50</td>
<td>2,828</td>
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<tr>
<td></td>
<td>Vapor barrier, peel &amp; stick, &amp; flashing</td>
<td>1,885.00</td>
<td>sfwl</td>
<td>3.00</td>
<td>5,655</td>
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<tr>
<td></td>
<td>Wood siding</td>
<td>1,885.00</td>
<td>sfwl</td>
<td>12.00</td>
<td>22,620</td>
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</tr>
<tr>
<td></td>
<td>Doors - new entry</td>
<td>1.00</td>
<td>ea</td>
<td>2,000.00</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doors - new sliding glass to patio</td>
<td>1.00</td>
<td>pr</td>
<td>2,000.00</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Windows - large living room window</td>
<td>50.00</td>
<td>sf</td>
<td>75.00</td>
<td>3,750</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Windows - sliders (5 ea at various sizes)</td>
<td>104.00</td>
<td>sf</td>
<td>50.00</td>
<td>5,200</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Windows - fixed (2 ea)</td>
<td>14.00</td>
<td>sf</td>
<td>40.00</td>
<td>560</td>
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</tr>
<tr>
<td></td>
<td>Subtotal</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>B30</td>
<td>Roofing</td>
<td>1,715</td>
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</tbody>
</table>

Subtotal | | | | | | | |

44,613 | $23.67 /sf total ext wall
## RESIDENCE BUILDING CORRECTIVE SCOPE

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Rigid insulation</strong></td>
<td>965.00</td>
<td>sf</td>
<td>2.50</td>
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<tr>
<td></td>
<td><strong>Roof - membrane - flat &amp; low slope (over interior)</strong></td>
<td>835.00</td>
<td>sf</td>
<td>5.00</td>
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<tr>
<td></td>
<td><strong>Roof membrane - 4:12 slope (over interior)</strong></td>
<td>130.00</td>
<td>sf</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td><strong>Roof - membrane - over porch &amp; entry stoop overhangs</strong></td>
<td>180.00</td>
<td>sf</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td><strong>Roof - membrane - over carport</strong></td>
<td>570.00</td>
<td>sf</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td><strong>Roof edge coping</strong></td>
<td>220.00</td>
<td>ft</td>
<td>25.00</td>
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<tr>
<td></td>
<td><strong>Inside corner &amp; misc flashing</strong></td>
<td>1.00</td>
<td>bgt</td>
<td>300.00</td>
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<tr>
<td></td>
<td><strong>Leader heads and downspouts</strong></td>
<td>4.00</td>
<td>loc</td>
<td>250.00</td>
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<tr>
<td></td>
<td><strong>Skylights misc repairs - flashing &amp; caulking</strong></td>
<td>1.00</td>
<td>bgt</td>
<td>250.00</td>
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</tbody>
</table>

**Subtotal:** 18,038

**TOTAL: III. BUILDING EXTERIOR ENVELOPE:** 62,650

**Net Total Incl Mark-up:** 94,096

## IV. INTERIOR BUILDOUT & MEPF

### C10 Interior Construction
- **Patch drywall**
  - 1.00 bgt
  - 7,500.00
  - **Subtotal:** 7,500

**Net Total Incl Mark-up:** 94,096

### C30 Interior Finishes
- **Paint repaired walls and ceilings**
  - 1.00 bgt
  - 2,500.00
  - **Subtotal:** 2,500

**Net Total Incl Mark-up:** 94,096

### D20 Plumbing
- **Replace toilet**
  - 1.00 ea
  - 850.00
  - **Subtotal:** 850

### D30 HVAC
- **Hydronic piping from VC - include underground run**
  - 1.00 bgt
  - 3,500.00
  - **Subtotal:** 3,500

- **Hydronic sub metering at VC**
  - 1.00 bgt
  - 1,000.00
  - **Subtotal:** 1,000

- **Hydronic baseboard heaters & piping (assume qty)**
  - 3.00 ea
  - 1,500.00
  - **Subtotal:** 4,500

- **Thermostatic control**
  - 1.00 bgt
  - 750.00
  - **Subtotal:** 750

**Subtotal:** 9,750

**Net Total Incl Mark-up:** 94,096

### D40 Fire Protection
- **ASR, distribution piping, & heads complete**
  - 925 gsf
  - 15.00
  - **Subtotal:** 13,875

- **Connect to new water line at 5' from building**
  - 1.00 bgt
  - 1,000.00
  - **Subtotal:** 1,000

**Subtotal:** 14,875

**Net Total Incl Mark-up:** 94,096

### D50 Electrical
- **New load center - relocated**
  - 1 bgt
  - 2,500.00
  - **Subtotal:** 2,500

- **Replace outlets with tamper proof GFI**
  - 26 ea
  - 35.00
  - **Subtotal:** 910

- **Replace light fixtures with LED - interior**
  - 10 ea
  - 400.00
  - **Subtotal:** 4,000

- **Replace light fixtures with LED - exterior**
  - 7 sf
  - 500.00
  - **Subtotal:** 3,500

- **Dimmer switches**
  - 3 ea
  - 40.00
  - **Subtotal:** 120

- **Occupancy sensors**
  - 6 ea
  - 150.00
  - **Subtotal:** 900

**Subtotal:** 11,930

**Net Total Incl Mark-up:** 94,096

## V. SITEWORK (NIC UTILITIES)

### G1030 Site Earthwork
## RESIDENCE BUILDING CORRECTIVE SCOPE

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Trade</th>
<th>Assembly</th>
<th>Subtotal</th>
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<tbody>
<tr>
<td>G2050</td>
<td>Landscaping</td>
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<tr>
<td></td>
<td>Irrigation repair</td>
<td>1</td>
<td>2,000.00</td>
<td>2,000</td>
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<tr>
<td></td>
<td>Repair damaged landscaping</td>
<td>1</td>
<td>1,000.00</td>
<td>1,000</td>
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<td></td>
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<tr>
<td></td>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td>3,000</td>
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<td></td>
<td><strong>TOTAL: V. SITEWORK (NIC UTILITIES)</strong></td>
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<td></td>
<td>$4.86</td>
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<td>6,759</td>
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### VI. UTILITY SERVICES (NIC EXTENSION BEYOND SITE)

<table>
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<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Trade</th>
<th>Assembly</th>
<th>Subtotal</th>
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<tbody>
<tr>
<td>G3010</td>
<td>Water Supply</td>
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<tr>
<td></td>
<td>New domestic water service - incl tie-in to main - ded trench</td>
<td>140.00</td>
<td>100.00</td>
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<td></td>
<td>Fire water DDCV (backflow) assembly</td>
<td>1.00</td>
<td>3,500.00</td>
<td>3,500</td>
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<td></td>
<td>Fire Dept connection / PIV - assumed to not be required</td>
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<td></td>
<td>Water service meter fees - excluded - separate owner budget</td>
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<td>G3020</td>
<td>Sanitary Sewer</td>
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<tr>
<td>G3030</td>
<td>Storm Sewer</td>
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<td>G3060</td>
<td>Fuel Distribution</td>
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<td>G4010</td>
<td>Electric Distribution</td>
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<td>G4030</td>
<td>Site Communications &amp; Security</td>
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<tr>
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<td><strong>Subtotal</strong></td>
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<td></td>
<td>-</td>
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<tr>
<td></td>
<td><strong>TOTAL: VI. UTILITY SERVICES (NIC EXTENSION BEYOND SITE)</strong></td>
<td>17,500</td>
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<td>$18.92</td>
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## Raw Cost of Work

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<tr>
<td>General Expenses (Incl 2.5% for District Reqs)</td>
<td>12.50% 22,496</td>
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<tr>
<td>Contractor's Fee (OH &amp; Profit)</td>
<td>10.00% 20,247</td>
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<td>Contractor Insurance</td>
<td>1.00% 2,539</td>
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<td>Building Permit</td>
<td>0.00% -</td>
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<tr>
<td>Contingency</td>
<td>20.00% 45,050</td>
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<tr>
<td>Cost Escalation - Excluded</td>
<td>0.00% -</td>
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**Total Budget Estimate - Hard Construction**: 90,332 270,301
# Ancillary Facility Upgrades

## I. Accessible Path of Travel from Parking to Bridge

### Estimate Detail

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotal</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>Mobilization &amp; Proj Preparation</td>
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<tr>
<td></td>
<td>Temporary pedestrian &amp; traffic control</td>
<td>1.00 bgt</td>
<td>3,500.00</td>
<td>3,500</td>
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<tr>
<td></td>
<td>Construction Fencing</td>
<td>200.00 lf</td>
<td>7.50</td>
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<tr>
<td></td>
<td>Temp erosion control &amp; BMP measures</td>
<td>1.00 bgt</td>
<td>1,500.00</td>
<td>1,500</td>
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<td></td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
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<td><strong>6,500</strong></td>
<td><strong>6,500</strong></td>
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### G1010 Site Clearing

<table>
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<tr>
<th>Code</th>
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<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remove tree obstructing pathway head clearance</td>
<td>1.00 ea</td>
<td>1,500.00</td>
<td>1,500</td>
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</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1,500</strong></td>
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### G1020 Site Elements Demolition and Relocations

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Ext</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remove AC pathway from HC parking to circle</td>
<td>260.00 sf</td>
<td>2.50</td>
<td>650</td>
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<tr>
<td></td>
<td>Remove AC pathway at circle</td>
<td>810.00 sf</td>
<td>2.50</td>
<td>2,025</td>
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</tr>
<tr>
<td></td>
<td>Remove AC pathway at circle to bridge</td>
<td>650.00 sf</td>
<td>2.50</td>
<td>1,625</td>
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<tr>
<td></td>
<td>Cut and grind down pavement at truncated domes - crosswall</td>
<td>60.00 sf</td>
<td>7.50</td>
<td>450</td>
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<tr>
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<td>Cut and grind down pavement at truncated domes - parking</td>
<td>174.00 sf</td>
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### G1030 Site Earthwork

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<tr>
<td></td>
<td>Re-grade slope from HC parking to circle - to less than 5%</td>
<td>260.00 sf</td>
<td>3.00</td>
<td>780</td>
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<td></td>
<td>Remove AC pathway at circle - correct cross slope</td>
<td>810.00 sf</td>
<td>1.50</td>
<td>1,215</td>
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<td>Remove AC pathway at circle to bridge - correct cross slope</td>
<td>650.00 sf</td>
<td>1.50</td>
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### G2030 Pedestrian Paving

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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New AC at pathway from HC parking to circle</td>
<td>260.00 sf</td>
<td>7.00</td>
<td>1,820</td>
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<td>New AC at pathway at circle</td>
<td>810.00 sf</td>
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<td>New AC at pathway at circle to bridge</td>
<td>650.00 sf</td>
<td>7.00</td>
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### G2040 Site Development

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<tr>
<td></td>
<td>Railing with wheel guide at circle pathway</td>
<td>225 lf</td>
<td>150.00</td>
<td>33,750</td>
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<td></td>
<td>Railing with wheel guide at circle to bridge pathway</td>
<td>140 lf</td>
<td>150.00</td>
<td>21,000</td>
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<tr>
<td></td>
<td>Bridge guardrail - infill 6&quot; picket gap with intermediate pipe</td>
<td>50 pos</td>
<td>100.00</td>
<td>5,000</td>
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<tr>
<td></td>
<td>Concrete pad for wheelchair at bus stop bench - 5x5'</td>
<td>1 ea</td>
<td>1,000.00</td>
<td>1,000</td>
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<tr>
<td></td>
<td>Truncated domes at crosswalks (2 ea at 10'x3')</td>
<td>60 sf</td>
<td>25.00</td>
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<td>Truncated domes at parking to pathway (58'x3')</td>
<td>175 sf</td>
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<td>Tow away sign at HC parking</td>
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### G2050 Landscaping

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<td>Misc repairs - minor permanent soil retention measures</td>
<td>1 bgt</td>
<td>1,500.00</td>
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**Raw Cost of Work** | **97,415**
## ANCILLARY FACILITY UPGRADES

### I. ACCESSIBLE PATH OF TRAVEL FROM PARKING TO BRIDGE

#### Estimate Detail

<table>
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<th>item description</th>
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<th>unit cost</th>
<th>ext</th>
<th>subtotals</th>
<th>assembly</th>
<th>totals</th>
<th>quals &amp; assumptions</th>
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<td>-</td>
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**Total Budget Estimate - Hard Construction**

48,895 146,310
CONCEPT PHASE ESTIMATE

Project: Tilden Environmental Education Center
Comparative Scheme Option Estimates

Design Docs: EB Parks: Tilden Visitor Center
Document Date: 12/14/2016

ANCILLARY FACILITY UPGRADES

II. UTILITY UPGRADE - WATER SERVICE

<table>
<thead>
<tr>
<th>Estimate Detail</th>
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<tr>
<td>50</td>
<td>Mobilization &amp; Proj Preparation</td>
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<td>Mobilization &amp; Temporary facilities</td>
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<td></td>
<td>Traffic control</td>
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<td></td>
<td>Traffic plates</td>
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<td>Temp erosion control &amp; BMP measures</td>
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<td>Sawcut asphalt - meter to bridge</td>
<td>4,600.00 lf</td>
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<td>Sawcut asphalt - bridge to hydrants - see sitework</td>
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<td>Remove trench asphalt - meter to bridge (50'x 2,300lf)</td>
<td>11,500.00 sf</td>
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<td>Remove trench asphalt - bridge to hydrants - see sitework</td>
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<td>Baserock patch at trench - meter to bridge</td>
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<td>AC patch at trench - meter to bridge</td>
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<td>Patch at trench - bridge to hydrants - see sitework</td>
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<td>Fire water pipe to bridge - 6&quot; PVC</td>
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<td>Domestic water pipe to bridge - 4&quot; PVC</td>
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<td>Irrigation water pipe to bridge - 4&quot; PVC</td>
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<td></td>
<td>Fire water pipe crossing bridge - 6&quot; Steel</td>
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<td>150.00</td>
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<td></td>
<td>Domestic water pipe crossing bridge - 4&quot; Steel</td>
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<td></td>
<td>Irrigation water pipe crossing bridge - 4&quot; Steel</td>
<td>40.00 lf</td>
<td>150.00</td>
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<td></td>
<td>Fire water pipe bridge to termination - 6&quot; PVC</td>
<td>400.00 lf</td>
<td>45.00</td>
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<td>Domestic water pipe bridge to termination - 4&quot; PVC</td>
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<td>35.00</td>
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<td></td>
<td>Irrigation water pipe bridge to termination - 4&quot; PVC</td>
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<td>Tie new pipe into existing service at meter</td>
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<td>New 2&quot; irrigation meter</td>
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<td>Replace fire hydrants at front of VC building</td>
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<td>Trenching &amp; stockpile</td>
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Raw Cost of Work | | 631,750 |

General Expenses (Incl 2.5% for District Reqs) | | 12.50% | 78,969 |
Contractor's Fee (OH & Profit) | | 10.00% | 71,072 |

Page 25 of 47
## ANCILLARY FACILITY UPGRADES
### II. UTILITY UPGRADE - WATER SERVICE

<table>
<thead>
<tr>
<th>code</th>
<th>item description</th>
<th>quantity</th>
<th>unit cost</th>
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<th>quals &amp; assumptions</th>
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**Total Budget Estimate - Hard Construction**

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<td>948,844</td>
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EB PARKS: TILDEN VISITOR CENTER
REMODEL SCHEME
12/14/16, SIEGEL AND STRAIN ARCHITECTS

Site Prep & Demo - (Major Items)

- Demo - Front Patio - Conc - Q1 952 SF
- Demo - Front Patio - Wood Deck - Q1 360 SF
- Demo - Front Entry Walk - Conc - Q1 1,386 SF
- Demo - Walkway Around to Back - Conc - Q1 3,245 SF; Q2 270 LF
- Demo - Back Patio Structure - Conc (Post Tension over Storage) - Q1 895 SF
- Demo - Mud Deck & Ramp - Conc - Q1 216 SF
- Demo - Workroom Exit Steps - Conc - Q1 37 SF
- Demo - Tree Removal - Q1 10 EA
- Perimeter Fence - Q1 1,290 LF

- Demo Add - Replace Scheme - Parking Lot - Asphalt - Q1 6,804 SF
- Demo Add - Replace Scheme - Remove Carport - Q1 648 SF
- Demo Add - Replace Scheme - Propane Pad - Con - Q1 228 SF
- Demo Add - Replace Scheme - Clear Cluster of Trees - Q1 6,337 SF
General Building Area Breakdown

- Remodel - Gen Interior Area Footprint - Q1 11,981 SF ; Q2 544 LF
- Remodel - Entry Porch Footprint - Q1 1,011 SF
- Remodel - Back Mudporch Footprint - Q1 721 SF
- Remodel - Lobbies / Exhibit / Info Store - Q1 5,097 SF ; Q2 411 LF
- Remodel - Restrooms - Q1 827 SF ; Q2 154 LF
- Remodel - Classroom - Q1 598 SF ; Q2 101 LF
- Remodel - Conf Rooms - Q1 478 SF ; Q2 100 LF
- Remodel - Kitchen - Q1 205 SF ; Q2 59 LF
- Remodel - Animal - Q1 141 SF ; Q2 51 LF
- Remodel - Workroom - Q1 1,912 SF ; Q2 223 LF
- Remodel - Auditorium - Q1 1,371 SF ; Q2 166 LF
- Remodel - Storage/Mechanical - Q1 481 SF
- Remodel - Shop - Q1 454 SF ; Q2 87 LF

- Plumbing Fixture - Q1 26 EA

- Remodel - Int Doors Pair - Auditorium/Classroom - Q1 2 EA
- Remodel - Int Doors Single - Q1 12 EA
Structural Modifications

- Remodel - Reconstruct Footings/Slab & Re-support Central Roof - Q1: 1,155 SF; Q2: 223 LF
- Remodel - Infill Fireplace Circle Room (aprox 2'0 thick) - Q1: 92 SF; Q2: 91 LF
- Remodel - Infill Floor - Office Wing (1'0 deep) - Q1: 1,375 SF; Q2: 220 LF
- Remodel - New Building Structure - Q1: 134 SF; Q2: 62 LF
- Remodel - New Entry Roof Structure - Q1: 675 SF; Q2: 123 LF
- Remodel - New Mud Porch Roof Structure - Q1: 597 SF; Q2: 102 LF
Roof Areas

- Remodel - Roof - Flat - Q1 1,073 SF; Q2 463 LF
- Remodel - Roof - 12:1.5 slope - Q1 7,761 SF; Q2 1,113 LF
- Remodel - Roof - 5:12 - Q1 1,241 SF; Q2 340 LF
- Remodel - Skylight - 9:12 - Q1 558 SF; Q2 197 LF
- Remodel - Down Spout +/- 13' - Q1 10 EA; Q2 130 LF
- Remodel - Shed Roof at Main Entry 12:1.5 slope - Q1 878 SF; Q2 129 LF
- Remodel - Shed Roof at Mud Porch 12:1.5 slope - Q1 602 SF; Q2 102 LF

Scale: 1/4" = 1'-0"
**MECHANICAL SHEET KEYNOTES**

1. HYDRONIC HEATING PAN COIL UNIT, WITH DUCTED OUTSIDE AIR CONNECTION FOR VENTILATION. (TYP #)

2. PROVIDE ALL EQUIPMENT FOR SOLAR THERMAL SYSTEM TO FEED HYDRONIC HEATING SYSTEM IN THIS ROOM. THIS INCLUDES BUT IS NOT LIMITED TO PUMPS, INSULATED STORAGE TANK, VALVES, PIPING, COLD WATER MAKE-UP, AND ALL AUXILIARY EQUIPMENT FOR A COMPLETE INSTALLATION.

3. HIGH-EFFICIENCY, CONDENSING HEATING HOT WATER BOILER FOR SUPPLEMENTAL HEAT TO SOLAR THERMAL SYSTEM. FUEL SOURCE: PROPANE.

4. BMS PANEL FOR FULL DDC CONTROL SYSTEM.

5. HEATING-ONLY RADIANT SLAB, COVERAGE AREA SHOWN BY HATCHED REGION.

6. SOLAR THERMAL COLLECTORS ON ROOF.

7. HYDRONIC RADIATORS FED BY HEATING HOT WATER SYSTEM IN VISITOR CENTER.

---

**Mechanical System Plan**

- Remodel - Hydronic Floor Heating - Q1 4,894 SF
- Remodel - Hydronic Fan Coils - Q1 6 EA
- Remodel - Propane Fired Boiler - Q1 1 EA
- Remodel - Solar Thermal System to Feed Hydronic - Q1 1 EA
- Remodel - DDC Control System - Q1 1 EA
- Extension to Intersection

- Sitework / Landscaping - Remodel Scheme

- Remodel - Back Mud Porch - Concrete - Q1 721 SF
- Remodel - Road to Little Farm - Regrade & Pave with Parktread - Q1 5,791 SF ; Q2 552 LF
- Remodel - Main Road in Park - Asphalt Overlay with Alt for Parktread - Q1 5,766 SF
- Remodel - Parking Lot - Asphalt Overlay - Q1 6,357 SF
- Remodel - Front Path - Parktread - Q1 245 SF
- Remodel - Front Trail - Compacted Dirt & Wood Tie Steps - Q1 531 SF
- Remodel - Front Bridge/Boardwalk - Wood Decking on Steel Beam & Conc Abut - Q1 1,203 SF
- Remodel - Retain Seat Wall (Assume Avg 5'w x 18"x18" Top) - Road Intersect - Q1 70 LF ; Q2 457 SF ; Q3 25 CY
- Remodel - Conc Seat Bench - at Bridge (Assume 18"x18") - Q1 60 LF ; Q2 181 SF ; Q3 10 CY
- Remodel - Conc Seat Bench - at Front Porches (Assume 18"x18") - Q1 97 LF ; Q2 282 SF ; Q3 15 CY
- Remodel - Front Bridge/Railing - Q1 65 LF
- Remodel - Fence & Gate Around Lift Station - Q1 155 LF ; Q3 155 LF
- Remodel - Ampitheater Stair Railing - Q1 48 LF
- Remodel - Rear Bridge Railing - Q1 27 LF
- Remodel - Front Porch - Concrete - Q1 2,996 SF
- Remodel - Back Porch - Concrete - Q1 1,389 SF
- Remodel - Front Trail - Compacted Dirt & Wood Tie Steps - Q1 531 SF
- Remodel - Front Bridge Railing - Q1 65 LF
- Remodel - Rear Bridge Railing - Q1 14 LF
- Remodel - Conc Seat Bench - at Bridge (Assume 18"x18") - Q1 60 LF ; Q2 181 SF ; Q3 10 CY
- Remodel - Conc Seat Bench - at Front Porches (Assume 18"x18") - Q1 97 LF ; Q2 282 SF ; Q3 15 CY
- Remodel - Rear Bridge Railing - Q1 27 LF
- Remodel - Drainage Swale Grading Area - Q1 19,022 SF
- Remodel - Conc Terraces at Rear - (18" + Footing) - Q1 206 LF ; Q2 588 SF ; Q3 33 CY
- Remodel - Ampitheater Stairs - Conc - Q1 155 LF ; Q2 12 EA
- Remodel - Front Porch - Concrete - Q1 1,389 SF
- Remodel - Rear Path/Trails - Parktread - Q1 1,837 SF
- Remodel - Meadow Grasses Back - Q1 17,728 SF
- Remodel - Retain Seat Wall (Assume Avg 5'w x 18"x18" Top) - Road Intersect - Q1 70 LF ; Q2 457 SF ; Q3 25 CY
- Remodel - Conc Seat Bench - at Bridge (Assume 18"x18") - Q1 60 LF ; Q2 181 SF ; Q3 10 CY
- Remodel - Conc Seat Bench - at Front Porches (Assume 18"x18") - Q1 97 LF ; Q2 282 SF ; Q3 15 CY
- Remodel - Front Bridge/Railing - Q1 65 LF
- Remodel - Fence & Gate Around Lift Station - Q1 155 LF ; Q3 155 LF
- Remodel - Amphitheater Stair Railing - Q1 48 LF
- Remodel - Rear Bridge Railing - Q1 27 LF
- Remodel - Front Porch - Concrete - Q1 2,996 SF
- Remodel - Rear Bridge Railing - Q1 14 LF
- Remodel - Conc Seat Bench - at Bridge (Assume 18"x18") - Q1 60 LF ; Q2 181 SF ; Q3 10 CY
- Remodel - Conc Seat Bench - at Front Porches (Assume 18"x18") - Q1 97 LF ; Q2 282 SF ; Q3 15 CY
- Remodel - Front Bridge/Railing - Q1 65 LF
- Remodel - Fence & Gate Around Lift Station - Q1 155 LF ; Q3 155 LF
- Remodel - Ampitheater Grading Area - Q1 3,187 SF
- Remodel - Drainage Swale Grading Area - Q1 16,822 SF
- Remodel - Meadow Grasses Front - Q1 21,386 SF
- Remodel - Wetland Planting - Q1 5,525 SF
- Remodel - Planter - Front - Q1 427 SF
- Remodel - Misc Planting Repair - Q1 3,323 SF
- Remodel - Screen Planting - Fence to Parking - Q1 43 LF
- Remodel - Tree Allowance (36" Box) - NTS Placement - Q1 1 EA
Remodel - Drainage Swale Grading Area - Q1 19,022 SF
Remodel - Drain Exfiltration/Bioswale - Q1 2 EA; Q2 788 SF
Remodel - Foundation Drain - Front - Q1 300 LF
Remodel - Foundation Drain - Back - Q1 390 LF
Remodel - Foundation Drain - Cut Across Pavement - Revise for Area Drains - Q1 131 LF
Remodel - Existing Swale - No Work - Q1 208 LF
Remodel - New Culvert from Swale to Creek - Cut Road - Q1 1 EA

**Conceptual Drainage Plan**

- **Earth Swale**
- **Main Drain Line:** 6" dia. with catch basins at ends, changes in direction and low spots
- **Bioretention Basin** per Contra Costa County requirements

Note: downspout connections and minor drain lines not shown.
The overall gross square footage of the replacement scheme is meant to be comparable to the area of the existing building, which is listed as 11,980 gsf. The total quantity derived from the sketch of this scheme is approximately 15% less. The quantities derived for this scheme therefore, have been adjusted in the estimate by a factor so the two schemes are then comparable in scope.
EB PARKS: TILDEN VISITOR CENTER
NEW SCHEME
12/14/16, SIEGEL AND STRAIN ARCHITECTS

Replace - Ext Wall - Exhibit Front Glass Walls (avg 22') - Q1 1,062 SF ; Q2 48 LF
Replace - Ext Wall - Exhibit Back Glass Walls w/12' Sliders (avg 22') - Q1 750 SF ; Q2 34 LF
Replace - Ext Wall - Lobby Front Glass Walls (assume 12') - Q1 224 SF ; Q2 19 LF
Replace - Ext Wall - Main Entry Vestibule (assume 13') - Q1 330 SF ; Q2 25 LF
Replace - Ext Wall - Exhibit Side Entry Walls (avg 18') - Q1 482 SF ; Q2 27 LF
Replace - Ext Wall Main Bldg - Standard Walls w/Siding and Windows (12') - Q1 3,381 SF ; Q2 282 LF
Replace - Ext Wall Auditorium - Standard Walls w/Siding and Windows (12') - Q1 2,115 SF ; Q2 176 LF
Replace - Ext Wall Shop Bldg - Standard Walls w/Siding and Windows (12') - Q1 2,154 SF ; Q2 179 LF
Replace - Ext Doors - Storefront Main Entry - Pair - Q1 2 EA
Replace - Ext Doors - Large Exhibit Exit - Pair - Q1 2 EA
Replace - Ext Doors Auditorium - Pair - Q1 2 EA
Replace - Ext Doors Auditorium - Single w/Sidelites - Q1 1 EA
Replace - Ext Doors - Pair - Q1 3 EA
Replace - Ext Doors - Single - Q1 7 EA
Replace - Ext Doors - Shop Garage Door 10x10 - Q1 1 EA

Exterior Walls & Doors
Roof Areas

Replace - Roof - (4:12) - Q1 12,757 SF ; Q2 893 LF
Replace - Patio Roof - (4:12) - Q1 7,141 SF ; Q2 1,052 LF
Replace - Skylight - Q1 147 SF ; Q2 37 LF
MECHANICAL SHEET KEYNOTES

1. HYDRONIC HEATING FAN COIL UNIT, WITH DUCTED OUTSIDE AIR CONNECTION FOR VENTILATION. (TYP 6)

2. PROVIDE ALL EQUIPMENT FOR SOLAR THERMAL SYSTEM AND CONNECT TO HYDRONIC HEATING SYSTEM IN THIS ROOM. SYSTEM INCLUDED BUT IS NOT LIMITED TO PUMPS, INSULATED STORAGE TANK, VALVES, PIPE, COLD WATER MAKE-UP, GLYCOL, FEED TANK, DRAIN DOWN TANK, AND ALL AUXILIARY EQUIPMENT FOR A COMPLETE INSTALLATION.

3. HIGH-EFFICIENCY, CONDENSING HEATING HOT WATER BoILER FOR SUPPLEMENTAL HEAT TO SOLAR THERMAL SYSTEM. FUEL SOURCE: PROPANE.

4. BMS PANEL FOR FULL DDC CONTROL SYSTEM.

5. HEATING-ONLY RADIANT SLAB, COVERAGE AREA SHOWN BY HATCHED REGION.

6. SOLAR THERMAL COLLECTORS ON ROOF.

7. HYDRONIC RADIATORS FED BY HEATING HOT WATER SYSTEM IN VISITOR CENTER.

Replace - Hydronic Floor Heating - Q1 3,073 SF
Replace - Hydronic Fan Coils - Q1 6 EA
Replace - Propane Fired Boiler - Q1 1 EA
Replace - Solar Thermal System to Feed Hydronic - Q1 1 EA
Replace - DDC Control System - Q1 1 EA
Replace - Trench - Hydronic Piping & Controls Btwn Buildings - Q1 102 LF

Mechanical System Plan
**Sitework / Landscaping - Replace Scheme**

- Replace - Main Road in Park - Asphalt Overlay with Alt for Parktread - Q1 7,803 SF
- Replace - Parking Lot - New Asphalt - Q1 7,706 SF
- Replace - Road to Little Farm - Regrade & Pave with Parktread - Q1 5,422 SF ; Q2 571 LF
- Replace - Entry Walks Parktread - Q1 1,563 SF ; Q2 282 LF
- Replace - Rear Path/Trails - Parktread - Q1 1,724 SF
- Replace - Front Path - Parktread - Q1 1,172 SF
- Replace - Rear Path/Trails - Parktread - Q1 1,724 SF
- Replace - Front Porch - Concrete - Q1 2,457 SF
- Replace - Pass Thru and Center Court - Concrete - Q1 5,104 SF
- Replace - Back Porch - Concrete - Q1 951 SF
- Replace - Conc Terraces at Rear - (18" + Footing) - Q1 172 LF ; Q2 383 LF ; Q3 29 CY
- Replace - Ampitheater Stairs - Conc - Q1 74 LF ; Q2 6 EA
- Replace - Seat Wall at Entry Road/Walks - 18"x18" - w/Footing - Q1 111 LF ; Q2 332 SF ; Q3 18 CY
- Replace - Seat Wall at Front Porch - 18"x18" - w/Footing - Q1 74 LF ; Q2 223 SF ; Q3 12 CY
- Replace - Seat Wall Above Ampitheater - 18"x18" - w/Footing - Q1 50 LF ; Q2 151 SF ; Q3 8 CY
- Replace - Conc Terraces at Rear - (18" + Footing) - Q1 172 LF ; Q2 515 SF ; Q3 29 CY
- Replace - Amphitheater Stairs - Conc - Q1 74 LF ; Q2 6 EA
- Replace - Amphitheater Star Railing - Q1 49 LF

- Replace - Fence & Gate Around New Parking & Gate at Lift Station - Q1 413 LF ; Q2 413 LF
- Replace - Meadow Grasses Front - Q1 20,688 SF
- Replace - Meadow Grasses Back - Q1 26,656 SF
- Replace - Meadow Grasses - Around Parking Lot - Q1 4,267 SF
- Replace - Native Garden - Building Planters - Q1 880 SF
- Replace - Screen Planting - Fence to Parking - Q1 120 LF
- Replace - Tree Allowance (36" box) - NTS Placement - Q1 15 EA
Replace Scheme - Grading Areas & Drainage Plan

Replace - Amphitheater Grading Area - Q1 9,280 SF
Replace - Parking Lot Grading Area - Q1 13,598 SF
Replace - Building Pad Grading Area - Q1 26,670 SF

Replace - Drain Exfiltration/Bioswale - Q1 2 EA; Q2 816 SF
Replace - Foundation Drain - Front - Q1 397 LF
Replace - Foundation Drain - Back - Q1 403 LF
Replace - Trench Drain - Back - Q1 44 LF

Replace - New Culvert from Swale to Creek - Cut Road - Q1 1 EA
Replace - New Culvert Under New Entry Paths - Q1 2 EA
Replace - Existing Swale - No Work - Q1 367 LF

Conceptual Drainage Plan

- Earth Swale
- Main Drain Line: 6' dia. with catch basins at ends, changes in direction and low spots
- Bioretention Basin per Contra Costa County requirements

Note: Downspout connections and minor drain lines not shown.
Replace Scheme - Utility Plan

Replace - New Domestic Water Line (Assume Connection Point) - Q1 79 LF
Replace - FDC Pipe to Building - Q1 83 LF
Replace - Upsize Water Fire Line in Joint Trench w/Domestic Water - Q1 71 LF
Remodel - Relocate Fire Hydrant to Accommodate Grading - Q1 1 EA
Replace - DDCV for Fire - Q1 1 EA
Replace - Add Meter for Fire Service - Q1 1 EA
Replace - New Domestic Water Line (Assume Connection Point) - Q1 79 LF
Replace - Upsize Water Fire Line in Joint Trench w/Domestic Water - Q1 71 LF
Remodel - New Water Line to Res - Q1 129 LF
 Replace - New Sanitary Sewer - Connect to Existing - Q1 116 LF
Replace - New Domestic Water Line to Shop Bldg - Q1 38 LF
Replace - New Fire Line to Shop & Aud Bldgs - Q1 58 LF

Conceptual Utility Plan

Existing Sewer Line – Confirm capacity and condition, replace as required
New Sewer Line – To be sized based on anticipated flows, assume 6"
Existing Water Line – Confirm capacity and condition, replace as required
New Water Line – To be sized based on required flows, assume 6"
Residence: MEP

- Outlets to be Changed to GFI - Q1 26 EA
- Lights to be Changed to LED - Q1 17 EA
- Base Board Heaters Change to Hydronic - Q1 1 EA
- Remove Gas Wall Heater - Q1 1 EA
- Toilet - Q1 1 EA
- Sink/Lav - Q1 2 EA
- Shower/Tub Faucet - Q1 1 EA
- Water Heater - Q1 1 EA
Path of Travel Upgrades - HC Parking to and Including Bridge

- Truncated Domes - at HC Parking to Path - Q1 58 LF ; Q2 175 SF
- Truncated Domes - at Cross Walk - Q1 20 LF ; Q2 61 SF
- Add Tow-away Sign - Q1 1 EA
- AC Path (6’0) - Regrade to Less than 5% - Q1 260 SF ; Q2 43 LF
- AC Path (6’0) - Regrade to Correct Cross Slope - At Circle - Q1 811 SF ; Q2 273 LF
- AC Path - Regrade to Correct Cross Slope - Circle to Bridge - Q1 648 SF ; Q2 158 LF
- Conc Pad for Wheel Chair at Bus Bench - Q1 25 SF ; Q2 1 EA
- Rails at Path - Circle (Incl Wheel Guide) - Q1 224 LF
- Rails at Path - Circle to Bridge (Incl Wheel Guide) - Q1 139 LF
- Upgrade Guardrails at Bridge - Infill Pickets at 6" Gaps (Pipe) - Q1 40 LF
- Remove Tree - Obstructing Path Head Clearance - Q1 1 EA