Laramie Child Development Corporation
Albany County, Wyoming

Feasibility Study
May 5, 2011
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I. Executive Summary

The LCDC proposes to develop a new early education facility to serve the children and families of Laramie and Albany County, Wyoming. The intent of this feasibility study is to capture the goals for the physical facility and to explore a conceptual design on a proposed site.

Process: Albany County retained Ward + Blake Architects and D. W. Arthur Associates Architecture, Inc. to work with the LCDC representatives to develop this study. Through meetings and other communications, we established an architectural program and targeted a proposed site for the new facility. Subsequently, we developed conceptual drawings to illustrate a possible design concept for the project based on the architectural program and the limited information available about the preferred site.

We also developed a preliminary regulatory review addressing many of the relevant codes and guidelines that will need to be respected as the project is developed, and a preliminary opinion of probable cost for the project.

Results: The overall architectural program for the facility predicts that the new building will be in the range of 25,000 square feet. The boards comprising the LCDC selected a site based on a survey of the population base of the children and families they serve, as well as a projection of the potential population growth for the city. This site, west of the city, is known as the Gunnerson Site. As the LCDC prefers a site with an elevated aspect relative to surroundings (with distant views), and is interested in the possible advantages that can be realized with a two-story structure, the conceptual design was developed as on a southerly facing slope on the site, with direct access to playgrounds from both levels.

Initial cost projections were generated for the project and total approximately $1.062M for site work and $7.158M for the building, or a total of $8.2M.

The concept design developed allows for phased construction, and thus can be adjusted to meet a budget for the project somewhat less than the entire cost estimate.

Recommendations: We recommend that the LCDC pursue the following steps:
- Further due diligence on the preferred site to establish viability and prospective costs.
- Evaluation of funding sources and availability to establish a budget for the project.
- Retain our team to refine the design based on additional information developed in the above steps.
- Establish concurrence of goals, budget and site availability.
- Proceed with full design, documentation and construction of facility.
II. Architectural Program

The attached program was developed based on meetings and communications with the LCDC. It is intended to capture the goals for spaces and square foot allocations for the various components of the building. The program has been used as a guideline in developing the enclosed conceptual drawings. It is expected that both the program components and area allocations will be revisited and refined as part of the design process. Many qualitative aspects of a design cannot be expressed in this type of quantitative program presentation. Further, we expect that various factors such as program priorities, opportunities for shared space, budgetary considerations and others will play a role in the refinement of this document in future phases.
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Laramie Children's Learning Center (Albany County): Laramie Head Start and Developmental Preschool Joint Facility
Architectural Program
Project #1012.01
Date: 03/04/2011

Laramie-program-040411
D. W. Arthur Associates Architects, Inc.

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last update: 3/4/2011
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<td>Dolly Storage</td>
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<td>200</td>
<td>Included within lobby.</td>
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Admin & Support Subtotal 2,634

**OFFICES**

Offices - to be determined 660

Office Subtotal 660

SUBTOTAL (usable area) 17,297

**CIRCULATION & INT. WALL**

- circulation: assume 25% 4,325
  - interior walls/shafts, etc.: assume 35% 850
  - interior egress stair: 0 0
  - exterior egress stair: 0 0
  - elevator: 0 0
  - elevator machine room: 0 0

SUBTOTAL (circulation & interior walls) 5,189

TOTAL INTERIOR AREA 22,486

**TOTAL GROSS BUILDING AREA**

Conditioned Space 22,386

**OTHER BUILDING & TRANSITION AREAS (UNCONDITIONED)**

**CHILD ACCESSORY SPACES**

- Mudroom - 1st flr: 2 500 500 Semi-enclosed, unconditioned space
- Greenhouse: 1 200 200

Child Accessory Subtotal 800

**EXTERIOR STAIRS & SERVICE**

- Ext. Stair - to roof area: 0 250 0 Semi-enclosed, unconditioned space
- Recycle Trash: 0 150 150 Semi-enclosed, unconditioned space

Exterior Stair Subtotal 150
### EXTerior AREA

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<tr>
<td>Infant</td>
<td>Birth - 12 mo</td>
<td>75  8  600</td>
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<td>Toddler</td>
<td>12 mo-36 mo</td>
<td>75  20  1,500</td>
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<td>3-6 YRS AGE GROUP</td>
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<td>Preschool</td>
<td>3 - 6 years</td>
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**Playground Subtotal** 204 15,300 sf

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<td>Staff</td>
<td>500 sf/pace</td>
<td>69 13,800</td>
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<tr>
<td>Parent drop-off</td>
<td>200 sf/pace</td>
<td>20 4,000</td>
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<tr>
<td>Visitor</td>
<td>200 sf/pace</td>
<td>4 600</td>
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<tr>
<td>Vehicular circulation</td>
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**PARKING/Drives Subtotal** 93 28,680 sf

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<td>Dumpster</td>
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<tr>
<td>Service drive/delivery</td>
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</table>

**Service Subtotal** 1,000 sf

**TOTAL EXTERIOR AREA** 45,380 sf

**TOTAL AREA** (exterior and building) 69,716 sf

*Does not include requisite set-backs, green space allowances, and other areas that may be required for site exigencies, zoning, etc.*
III. Regulatory Review

The attached regulatory review was developed to identify major considerations for the design of the new facility. Because of the specialized use (early education and care), many of the regulatory considerations are very unique, and require coordination with multiple regulatory agencies. The following review is not intended to be comprehensive, but rather to identify major and unique issues, and to serve as a framework for more refined reviews as the design develops.
LARAMIE CHILD DEVELOPMENT CORPORATION (LCDC)

LARAMIE HEAD START AND DEVELOPMENTAL PRESCHOOL FACILITY

PRELIMINARY REGULATORY REVIEW

Prepared by:

D.W. Arthur Associates Architects, Inc.

Project No: 1012.01
Date: 03/04/11

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   F. Egress – Number of Exits
   G. Egress – Through Adjoining Spaces
   H. Number of Exit Stairs
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   J. Enclosed Elevator Lobbies
   K. International Fire Code (IFC) Regulations Regarding 2nd Floor Occupancy
   L. Child Care Licensing Rules (WDFS) Regarding 2nd Floor Occupancy
I. INTRODUCTION

A. Intent of Code Summary

A new early education and developmental preschool facility is being proposed in Albany County to serve the Laramie, Wyoming community. This center will provide day-time care for infant through preschool children. As the regulatory authorities frequently refer to this type of facility as child care, that terminology is used within the review. The center is proposed to accommodate approximately 200 children. A 2-story scheme is being considered to minimize the development sitework costs and to maximize the beneficial aspects of the existing topography.

The following is a regulatory analysis of specific issues that are unique to this occupancy type and the potential building design. It includes discussion of the code compliance issues related to occupancy of the 2nd floor by young children. The summary has been organized with a discussion of relevant issues followed by the supporting code and regulatory references. In the following text, all direct and paraphrased excerpts from the codes/regulations are referenced. Verbatim quotations from codes/regulations are italicized; copies of the actual text with commentary from the codes and regulations listed below are included at the end of the summary for additional reference.

Please note that this code summary is preliminary given the limited conceptual level of the design and only addresses the major code issues at this time. A more in depth code evaluation will be necessary during the subsequent design and construction document phases.

B. Applicable Codes/Regulations

International Code Council (ICC) Model Codes, 2006

This organization creates and updates model codes that are adopted by states across the country. The state of Wyoming has adopted the full complement of ICC model codes. The applicable ICC codes referenced in this summary include the following:

International Fire Code, 2006 edition (IFC)

Note #1: The ICC provides technical assistance to design professionals regarding code interpretations. For certain aspects of this summary where the code does not specifically address the condition that occurs in the proposed design, we have contacted them for their interpretation. Their interpretations have been included in the summary.

Note #2: The ICC Building Code has issued the 2009 edition of their codes but this edition has not yet been adopted by the State of Wyoming. The code evaluation will need to be revisited if the newer edition of the code is adopted by the state.

State of Wyoming Department of Family Services (WDFS), 2008

This state agency develops and updates regulations (Child Care Licensing Regulations) that apply to group child care programs within the state of Wyoming. The current regulations have been in effect since 09/01/08.

State of Wyoming Fire Marshal Office

This state agency provides mandatory plan reviews for certain building types, including buildings used for child care centers for more than ten (10) children. In accordance the § W.S. 35-9-106, the Wyoming Fire Marshal Office has adopted the ICC Model Code, 2006 edition. The full list of ICC codes that have been adopted (as identified in the agency’s website (www.wyofire.state.wy.us) is included.
II. MAJOR ISSUES AND CONSIDERATIONS

A. Building Use Group

The proposed use groups for the LCDC child care building can be Use Group E – Educational since the number of children aged 2 ½ years or less will be less than 100. If the number of children aged 2 ½ years or less exceeds 100 children, then the center would need to have a mixed use group - Use Group I-4 & Use Group E (unseparated).

Child care facility. A facility that provides supervision and personal care on less than a 24-hour basis for more than five children 2 ½ years of age or less shall be classified as Group I-4.
Exception: A child day care facility that provides care for more than five but no more than 100 children 2 ½ years or less of age, when the rooms where such children are cared for are located on the level of exit discharge and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at anyone time for educational purposes through the 12th grade. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 508.3.1 and have occupant loads of less than 100, shall be classified as A-3 occupancies.

Day Care. The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 ½ years of age, shall be classified as a Group E occupancy.

B. Automatic Sprinkler System Requirement

There are two sections in the codes that address the requirement of an automatic sprinkler system that are applicable to this project. In the Fire Protection section of the code, sprinkler systems are typically required for Use Group E for buildings of this size (over 20,000 sf). However, there is an exception that states that sprinkler systems are not required for Use Group E buildings if all classrooms have an exterior exit door at ground level. The proposed design currently provides exterior doors to all classrooms. It is important to note that the child care licensing regulations requires an automatic sprinkler system throughout all Group E fire areas great than 20,000 square feet in area (similar to the building code) but does not include the exception regarding grade level egress in the classrooms. This will need to be reviewed with the Fire Official and the state child care fire official if a non-sprinklered building is desired.

The other section where automatic sprinklers are referenced is in the building height and area section of the code. In the General Building Heights and Areas Section, the height and area limits can be increased based on the incorporation of a sprinkler system in the building. The building will likely need to have an automatic sprinkler system throughout the building to achieve desired the building size and 2 story height (see Section C – Building Height & Area Limitations below for more information). It may be possible to avoid the need for a sprinkler system depending on the building construction type and/or possible fire area separations. This would need to be studied further at the outset of the next design phase.

Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:  

[IBC sect. 903.2.2]
1. Throughout all Group E fire areas greater than 20,000 sf in area.
2. Throughout every portion of educational buildings below the level of exit discharge

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level.

Group I. An automatic sprinkler system shall be provided throughout Buildings with a Group I fire area. [IBC sect. 903.2.5]

C. Building Height & Area Limitations

The building code has restrictions on the number of stories, the building height and the building area; these restrictions are based on the types of occupants and the building construction.

With regard to building height, Use Group I-4 and Use Group E are typically limited to one story but when the building is equipped with a sprinkler system, the height limitation is increased by one story and 20 ft. This increase applies to all I-4 and E occupancies, regardless of construction type. Because the building will be to be fully sprinklered per the requirement identified in sect. 903.2.5, a two-story building is permitted for these use groups.

In terms of building area, the area limitation is determined by the building area per story. The construction type has not yet been determined for the project, however it will likely be either Type II-B (noncombustible, unprotected) or Type V-B (combustible, unprotected). Based on the project’s anticipated floor area per story, no fire separations will be needed to break the project into smaller compartments. The project has the following anticipated building area:

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<th>LCDC</th>
<th>1st flr: 12,000 sf (approx.)</th>
<th>2nd flr: 12,000 sf (approx.)</th>
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The following table is an excerpt from table 503 that identifies the limitations for the child care use groups:

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<th>Height</th>
<th>Area</th>
<th>Use Group</th>
<th>Height</th>
<th>Area</th>
<th>Use Group</th>
<th>Height</th>
<th>Area</th>
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<td>I-4</td>
<td>2 story, 55 ft, 13,000 sf</td>
<td>3 story, 65 ft, 25,500 sf</td>
<td>1 story, 50 ft, 18,500 sf</td>
<td>1 story, 40 ft, 9,000 sf</td>
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<td>I-4</td>
<td>3 story, 75 ft, 39,000 sf (w/ sprinkler)</td>
<td>4 story, 85 ft, 76,500 sf</td>
<td>2 story, 70 ft, 55,500 sf</td>
<td>2 story, 60 ft, 27,000 sf</td>
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<tr>
<td>E</td>
<td>2 story, 55 ft, 14,500 sf</td>
<td>3 story, 65 ft, 25,500 sf</td>
<td>1 story, 50 ft, 18,500 sf</td>
<td>1 story, 40 ft, 9,500 sf</td>
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<tr>
<td>E</td>
<td>3 story, 75 ft, 43,500 sf (w/ sprinkler)</td>
<td>4 story, 85 ft, 76,500 sf</td>
<td>2 story, 70 ft, 55,500 sf</td>
<td>2 story, 60 ft, 28,500 sf</td>
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* 1-4 Use Group is not permitted without sprinklers
** Area increase for sprinklers shown at 200%: additional area increases may be possible with increased frontage but are not included in the analysis at this time.

Automatic sprinkler systems: Where a building is sprinklered throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1., the value specified in Table 503 for maximum height is increased by 20 feet and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Section 506.2 and 506.3...

Automatic sprinkler system: Where a building, is equipped throughout with an approved automatic sprinkler system installed in accordance with section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200% for buildings with more than one story above grade plane and an additional 300% for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Group I. An automatic sprinkler system shall be provided throughout Buildings with a Group I fire area.

Group E. An automatic sprinkler system shall be provided for Group E [sect. 903.2.2] occupancies as follows:
- 3. Throughout all Group E fire areas greater than 20,000 sf in area.
- 4. Throughout every portion of educational buildings below the level of exit discharge

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level.

D. Fire Resistance Rating of Building Elements

The following table identifies the required fire rating of specific building elements for a particular construction type. The construction type has not yet been determined for the project, however it will likely be either Type II-B (noncombustible, unprotected) or Type V-B (combustible, unprotected). For these proposed construction types, no fire-rating of building elements is required unless otherwise indicated in other code sections.

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</tbody>
</table>

* Per Table 602, exterior wall rating based on fire separation distance, construction type and occupancy type. 1 hr. fire rating required for Use Group I up to a 30 ft. distance,
after 30 ft, 0 hr rating required. (Type II-B & V-B construction type is 0 hr between 10-30 ft).

** Per sec.602.4.6, interior walls within heavy timber assembly shall be of solid wood construction or other materials provided that they have 1 hr. min. fire rating.

*** 0 hr rating permitted where every part of the roof construction is 20 ft or more above any floor immediately below. Wood to be fire retardant instead.

Note: 1 hr. fire rating for Type 5A construction can be eliminated with sprinkler system provided that the sprinkler system is not otherwise required or used to increase area or height.

Corridor Fire-rating: Per IBC Table 1017.1, the fire resistance rating for corridors in buildings of use group I-4 occupancy, is 0 hrs. provided that the building has an automatic sprinkler system.

E. Egress - Maximum Length
In order to establish limits on the amount of exposure to hazardous conditions for occupants during a fire emergency, the building code has established a maximum length of exit access travel (the distance from the most remote portion of a story to the exit entrance); the code does not indicate a maximum evacuation time. Per IBC Table 1016.1, the maximum length of exit access travel to an exit in a building with an I-4 occupancy and with an automatic sprinkler system is 200 ft. In the LCDC project, the maximum travel distance is anticipated to be significantly shorter than the code limitations.

Max. length of exit access travel Without Sprinklers With Sprinklers
Use Group E 200 ft 250 ft
Use Group I-4 150 ft 200 ft

Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1016.1.

F. Egress – Number of Exits
Every floor of a building must be served by at least two exits. Three exits are required when the occupancy load of floor exceeds 500 (per IBC Table 1019.1). The LCDC project has an occupancy load of under 500 occupants per floor and will have two exits for each floor.

Depending upon the occupancy type and quantity of occupants anticipated for a particular space, two egresses from the space or room may be required. Per table 1015.1, the infant and toddler classrooms (Use Group I-4) and the preschool classrooms (Use Group E) are required to have two egresses from their rooms because they will have an occupant load over 10 (load includes both children and staff).

Spaces with One Means of Egress
Use Group – I-4: 10 max. occupant load
Use Group – E: 49 max. occupant load*
* day care maximum occupant load is 10

G. Egress – Through Adjoining Spaces
Egress through adjoining spaces is permitted with the following restrictions/requirements:
1. only through an adjoining room that is accessory to the area served
2. adjoining room not high hazard occupancy
3. adjoining room provides a discernable path of egress travel to an exit
4. max. of one exit access permitted to pass through a kitchen, storeroom, restroom, or closet as long as it is not the only means of egress
5. exit access shall not pass thru a room subject to locking

According to the code commentary, the adjoining space should provide an equivalent or increased level of safety as the occupants approach the exit. The code does not limit the number of adjoining spaces through which the egress can be made, provided that the other related requirements are met (i.e. travel distance, number of doorways, etc.).

There are no requirements in the IBC that require either of the two egress paths for the classrooms to be connected directly to grade.

Egress through adjoining spaces: Egress through adjoining spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas are accessory to the area served, are not a high-hazard occupancy and provide a discernable path of egress travel to an exit.
   
   Exception: Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.
   
   Exceptions:
   1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
   2. Means of egress are not prohibited through storckrooms in Group M occupancies when all of the following are met:
      2.1 The stock is of the same hazard classification as that found in the main retail area;
      2.2 Not more than 50 percent of the exit access is through the stockroom;
      2.3 The stockroom is not subject to locking from the egress side; and
      2.4 There is a demarcated, minimum 44-inch-wide aisle defined by full or partial height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

H. Number of Exit Stairs

The project design includes two interior stairways that connect the 1st and 2nd floor levels. Depending on the site design and egress route, it is possible that both stairs can be defined as not a required means of egress. This will permit more flexible stair enclosure requirements.

I. Stairway Enclosures
Typically, exit stairs are required to have a 1 hr. fire-rated enclosure but there is an applicable exception to this rule. Enclosures are not required for interior egress stairways that serve only the 1st and 2nd stories provided that the building has the following:
- automatic sprinkler system
- two (min) means of egress from each floor
- stairways shall be remotely located.

This exception does not apply to Use Group I.

**Enclosures Required.** Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress.

**Exceptions:**
4. Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.
8. In other than Group H & I occupancies, a maximum of 50% of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.
9. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stairways shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.

**J. Enclosed Elevator Lobbies**
An enclosed elevator lobby is required only when an elevator shaft connects more than 3 stories. Therefore a two-story building will not need enclosed elevator lobbies.

**Elevator Lobby.** An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code. Exceptions... (not included since elevator lobbies not needed for the anticipated building design)

**K. International Fire Code Regulations Regarding 2nd Floor Occupancy**
The International Fire Code (IFC) is a complementary code that is coordinated with the IBC. There are not many specific sections within the IFC that apply to this issue other than
requirements for fire safety plans, fire evacuation plans, fire and evacuation drills, and employee training and response procedures. These requirements for these plans and training are almost identical to the requirements listed in the WDFS child care licensing rules; the specifics of these requirements are identified in the following section.

L. Child Care Licensing Rules (WDFS) Regarding 2nd Floor Occupancy

The child care regulations have two chapters that address fire standards. Chapter 10 relates specifically to home-based programs and therefore doesn’t apply. Chapter 11 addresses child care centers. The regulations in this section are qualified by a statement at the end that permits the fire official to require additional correction of fire hazards beyond the fire standards of this chapter.

*These fire standards are basic requirements. The fire official, after conducting an on-site fire inspection, may require correction of other fire hazards.*

Exit Requirements: There is no reference in the child care regulations regarding limitations on occupancy of the second floor by infants, toddlers or preschoolers other than a section (WDFS Ch. 11.1.(d)) requiring new or relocated centers to comply with current building, fire and mechanical codes. The buildings’ exits will be designed to conform to the specific exit regulations identified in this section. These requirements include the following:

1. A minimum of two exits;
2. Exit doors shall be 3’-0” x 6”-8” (min.);
3. Exit doors shall swing in the direction of egress travel when serving an occupant load of fifty or more, shall be readily openable from the inside without key and shall have illuminated exit signage;
4. Required exit access, exits and exit discharges shall be free of obstructions, shall be free of snow and ice and shall have illumination;
5. Stairs shall have guardrails (42” high, min. with rail pattern to eliminate possible head entrapment (less than 3 ½” dia.)

Emergency Escape and Rescue: The child care licensing rules require that sleeping rooms have at least one exterior emergency escape and rescue opening. This section does not specify that the emergency escape must be on grade. The requirements for this escape are as follows:

1. The opening may be a window or door.
2. The opening must open directly to the exterior
3. The openings must have a clear opening size of 5.7 s.f. with a min. clear height of 24” and min. clear width of 20”
4. The bottom of the clear opening shall not be more than 44” above the floor
5. The opening shall be openable from the inside without key

It should be noted that the IBC also has a section regarding emergency escape and rescue openings that is very similar to the WDFS section but applies only to Use Group R and I-1 occupancies. Per the IBC Commentary, the IBC section applies to buildings where occupants may be sleeping during a potential fire buildup but are capable of self-preservation. Use Group I-1 relates to occupancies that are supervised, 24 hr. residential environments in which the occupants are capable of responding to an emergency situation without physical assistance from staff. The Type R use groups apply to environments that include sleeping functions but are not classified as an Institutional Use Group or are not regulated by the International Residential Code. The emergency opening is not required for these occupancies (other than R-3) in buildings that have automatic sprinkler systems.

Because the I-4 Use Group is considered by the code to be a more hazardous group (occupants need assistance in egress during emergencies), the requirements for the child care use are more restrictive than those for Use Group I-1 or Use Group R with regard to sprinkler system requirements, enclosed exits, length of exit access travel, number of exits from spaces, interior...
finish classifications, etc. In addition, the I-4 use group has sleeping functions that are always supervised by staff. Since buildings with I-4 use have more safety provisions, the ICC does not require buildings with this use group to have emergency escape and rescue openings. There is concern that having emergencies escape and rescue openings may, in fact, present other safety issues if the children could get access to the window and it is readily openable from the interior. Per the IFC, grilles are permitted over emergency openings provided that the net clear opening meets the requirements and that they are releasable from the inside without the use of key or excessive force. Further discussions with the WDFS County Inspector will be needed to determine the applicability of this requirement.

Emergency. Sleeping rooms shall have at least one exterior emergency escape and rescue opening (may be a window or door). Such an opening shall open directly to the exterior.

(a) Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet. The minimum net clear opening height shall be twenty-four (24) inches; the minimum net clear opening width shall be twenty (20) inches.

(b) Emergency escape and rescue openings shall have the bottom of the clear opening not greater than 44 inches measured from the floor.

(c) Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.

General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R and I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:

1. In other than Group R-3 occupancies, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Emergency escape openings. Required emergency escape openings shall be maintained in accordance with the code in effect at the time of construction, and the following: Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are allowed to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and such devices shall be releasable or removable from the inside without the use of force greater than that which is required for normal operation of the escape and rescue opening.

Fire Safety & Evacuation Plans and Evacuation Drills: The child care licensing rules require a fire safety and evacuation plan to be prepared, approved by the fire official, and maintained for Group E
occupancies. The requirements do not address evacuation issues related to multi-floor buildings or maximum evacuation time periods but does reference ‘areas of refuge.’ Evacuation drills must be held monthly and records must be kept documenting the details of each drill; the time required to complete the evacuation is to be included. The requirements for the plans are identical to the requirements specified in the International Fire Code (IFC); the requirements for the drills are almost identical to the IFC requirements however there are a few specific sections added to address outdoor assembly areas in the WDFS rules.

**Fire Safety and Evacuation Plans.**

(a) An approved fire safety and evacuation plan shall be prepared and maintained in Group E occupancies.

(i) Fire safety and evacuation plans shall be reviewed or updated annually or as necessitated by changes in staff assignments, occupancy, or the physical arrangement of the building.

(ii) Fire safety and evacuation plans shall be available in the workplace for reference and review by employees, and copies furnished to the fire official for review upon request.

(b) Fire Evacuation Plans shall contain the following:

(i) Emergency egress or escape routes;

(ii) Procedures for employees who must remain to operate critical equipment before evacuating;

(iii) Procedures for accounting for occupants after evacuation has been completed;

(iv) Identification and assignment of personnel responsible for rescue or emergency aid;

(v) The preferred and any alternative means of notifying occupants of fire or emergency;

(vi) The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization;

(vii) Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan; and

(viii) A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided.

(c) Fire Safety Plans shall include the following:

(i) The procedure for reporting a fire or other emergency; and

(ii) The life safety strategy and procedures for notifying, relocating, or evacuating occupants.

(iii) Site plans indicating the following:

(A) The occupancy assembly point;

(B) The locations of fire hydrants; and

(C) The normal routes of fire department vehicle access.

(iv) Floor plans identifying the locations of the following:

(A) Exits;

(B) Primary evacuation routes;

(C) Secondary evacuation routes;

(D) Accessible egress routes;

(E) Areas of refuge;

(F) Manual fire alarm boxes;

[WDFS Ch.11, Sect.16]
(G) Portable fire extinguishers;
(H) Occupant-use hose stations; and
(I) Fire alarm annunciator panels and controls.

(code section continues to explain employee training…not relevant to this topic).

END OF REVIEW
IV. Conceptual Design

a. Narrative

The following comments are intended to assist in communication of underlying design strategies that led to the development of the conceptual plans. Note that the list and description of drawings follows this section. For purposes of brevity, we are calling the facility the LCDC.

The narrative contains the following sections:

A. Assumptions
B. Overall Site Strategy
C. Building Organization
D. Basic clustering
E. General/Common Areas
F. Exterior Spaces and Environments
G. Sustainability
H. Potential for Phased Construction

A. Assumptions

1. Please note that we have developed the conceptual design and plans with limited information about the proposed site. We have received some data, but cobbled together a site plan to included some topographical information. We have not utilized an actual topographical survey (we understand that none has been made available to date), but instead overlaid contour lines from a USGS maps. Therefore, the topographical information we are working with is speculative at best. We believe based on observation and from Google sources, that the general topographical features indicated exist, but we are speculating as to exact locations and grade changes, etc. We strongly advise that a topographical survey be conducted prior to the next round of design (beyond the scope of our current contract), as the design concepts are highly dependent on working with existing topography.

B. Overall Site Strategy

1. Consistent with discussions to date, the conceptual site plan (SK/01) situates the LCDC facility on the southern end of the Gunnerson property in West Laramie. From the information we have to date, this part of the site includes a relative high point or two (hills), and a sloping topography with a substantial area that slopes down in a southerly direction.

   a. The relative “height of land” affords distant views to mountains.
   b. The relative “height of land” affords generous, relatively unobstructed solar exposure
   c. The southern slope maximizes solar exposure for a two-story building organization
   d. The sloping topography allows for a two-story building with grade exits at both floors.

   a. This organization can lead to a more compact overall organization.
   1. More compact building can reinforce a tighter sense of community
   2. More compact, 2 story building can be more cost effective construction

2. The site is accessed from Colorado Boulevard which flanks the eastern edge of the property.

   a. Vehicular circulation, parking, servicing, etc. are anticipated to be confined to the eastern edge of the site.
   b. this strategy will minimize development requirements by keeping paved areas to a minimum.
c. This strategy will reserve as much of the site as possible for development of
   the building and surrounding outdoor play environments.

    d. This strategy also allows for both a reduced first phase construction (if
      desired) and/or possible expansion in the future with minimal impact on
      developed areas.

C. **Building Organization**

1. As mentioned above, a 2-story strategy is proposed in the conceptual plans.

2. The building is essentially rectangular in footprint, disposed with the long axis running E-W,
   thus exposing the long side to the southern solar exposure.
   
   i. This basic disposition can help maximize solar gain in the winter, and passive cooling
      in the summer.

3. The building is conceived of with an offset section, allowing for considerable overlap
   between lower and upper floors via double-height spaces.
   
   i. This overlap will help encourage continuity throughout the center and a commensurate
      sense of community.
   
   ii. The offset also allows for a simple (cost effective) monopitch roof that basically
        parallels the sloping grade of the hillside.
   
   iii. At strategic locations, dormers are introduced to provide shared day lighting at the
        interior of the building, (especially at double-height spaces), along with views to
        distant mountain ranges.

4. The building is organized along a continuous, gently curved circulation spine. This is
   intended to be a strong organizing element, both horizontally and vertically between floors.
   
   i. The curving path is intended to be developed to tie into the existing site topography (as
      we do not have a survey yet, the actual configuration would need to be refined to work
      with real topography).
   
   e. The path begins at the eastern parking area and curves along the hillside on
      a level contour, through the building, and extending beyond into the
      landscape beyond culminating in an amphitheatre carved into the hillside on
      the western end of the building.

   ii. The curving path is intended to provide a strong organizing element off of which a rich
      variety of spaces occur. This path is not defined by a long, institutional corridor; rather
      it is conceived of as being identified by a long masonry wall that not only extends into
      the landscape on both the east and west exterior of the building, but also extends
      vertically two stories (thus being a common touchstone on both levels).

   f. The stone/masonry wall that defines the curved path begins at the far
      eastern edge of the project as a low retaining wall near the drop off and pick
      up parking. The wall begins as a series of low elements at different
      contours, set into the hillside in a splayed, roughly concentric manner. As
      the path gets closer to the building entrance, the wall segments converge
      and become one retaining wall that is an entire story high (12-16’). This
      way, the wall acknowledges and negotiates the transition from the sloping
      hillside that the building is set into to the distinct two-story organization of
      the interior.
g. At the entrance, one approaches along the wall (it acts as a retaining wall to the north) and arrives at welcoming reception area/lobby with generous windows to the east.

h. Just beyond the lobby is the Piazza, a multi purpose space intended to accommodate not only a range of activities for young children, but also to serve as a community resource (see discussion below).

i. Part of the Piazza space is double-height, and thus the upper level of the curved path becomes a balcony at this area, with shared daylight from a large dormer, along with views and overlapping space between both levels (encouraging a sense of continuity and community between both floors)

j. At the offices/therapy rooms just beyond, a common area is also double-height, again sharing daylight and continuity with the spaces above.

k. Just beyond the offices is the first cluster of classrooms (3 shown). At this area, the circulation path widens to create activity and transition spaces, again connected spatially to above with double height space and a stair.

l. Between the first and second cluster of classrooms, the pathway moves past on open courtyard. We envision this exterior wall to be all glass and shading (to moderate solar gain) and have doors leading to the exterior.

m. The second classroom cluster again has a wider transitional zone for extended activities, transitions, serendipitous family chats, etc. Again, it is double-height, spatially weaving the upper and lower levels of the building together.

n. At the western end of the building, the curved path becomes part of the studio/atelier. The stone/masonry wall could be segmented to allow for some spatial definition (wall segments suggesting zones/areas within the studio such as ceramics/kiln, painting, storage, etc. The openings between wall segments providing access). The segments of wall that remain would continue the curve that began at the drop off area at the east entry, and carry the curve out into the western landscape.

o. Finally, at the western end, the wall remerges from the building into the landscape and splays out into the hillside hollow in a concave manner, allowing for the creation of an outdoor amphitheater with a southeastern orientation. Much like the beginning of the wall at the arrival on the east end, the wall again slides apart and melds into the natural topography of the existing landscape.

p. On the upper floor, these spatial variations also transform what could otherwise seem a long corridor into a rich sequence of varying spatial experiences. Intermittent dormers with daylight and views to distant mountains, overlooks to below, access to outdoors, etc, all animate the experience of moving along this curving path.

q. Overall this thick, masonry wall element ties the building to the landscape and helps to orient people not only within the building, but also within the landscape. This is consistent with our efforts to tie the building firmly to the landscape in all ways, including the fundamental programmatic goal of providing connections from each classroom that encourage children to flow from inside to outside and back with minimal restrictions.

5. The entrance is on the lower level. To the south are public spaces and classrooms. To the north of the path, bermed into the hillside are service rooms.

6. On the upper level, the path is flanked on the north side by classrooms.

7. Classrooms on each floor let out to age-appropriate playgrounds at grade.
D. **Basic clustering**

1. The (13) classrooms have been organized for an efficient and compact layout, but with some clustering to enable them to be considered as small communities within the larger overall community of the center. This has been accomplished by introducing outdoor courts which subdivide the classrooms into groups or pods of 3 to 5 classrooms. As this is a first conceptual layout, we expect that the groupings may need to be adjusted to cluster different rooms with one another, but the basic strategy will allow for flexibility in particular groupings, if desired.

E. **General/Common Areas**

1. Generally, the center has been conceived of as a vital community center, reaching out to the general population as well as the families of the children served daily.

2. Piazza
   
   i. A main central space is shown that is intended to serve multiple purposes.

   ii. During the day, the piazza can support numerous activities, including large motor play, particularly on those days when the weather is really unsupportive of outdoor play. The space can also be configured and equipped to support a range of therapeutic motor activities.

   r. Ample storage is shown near the piazza; critical to a truly multi-purpose space of this nature.

   iii. At other times (in the evenings, for example), the piazza can be transformed into a community space.

   s. a stage (along with proscenium and wings) is shown, to sponsor dramatic and other kinds of performances, and a host of other activities.

   iv. The piazza is situated near the lobby not only as a welcoming common space for those who arrive on a daily basis, but also so that this part of the center could be open while other parts of the center are closed (in the evenings).

   t. The plan indicates a sliding “barn door” at the office area which, when closed, could limit access to the rest of the rooms in the center off hours, as desired. The kitchen is located within this front area, to allow for meals in support of activities. Adult restrooms are located here as well.

   u. A door could be located on the upper level along the curved pathway, also restricting off-hours access beyond the double height space that is part of the Piazza. Including this part of the upper floor could further expand the use of the Piazza. (Additional seating/standing room could occur at the balcony overlooking the stage for events).

   v. We are showing a series of exterior doors to the south porch, implying that this space could be wide open to an outdoor space (patio, gardens, etc.) to expand the community/early education uses to the outside. For example, some centers serve essentially as surrogate neighborhoods, and organize BBQ’s and other family-oriented activities on weekends and evenings. Or, if a community drama group stages a production, intermission might be outside.
F. Exterior Spaces and Environments

1. Playgrounds.
   i. Age appropriate playgrounds will be located at each level, directly accessible from each classroom

2. Solar considerations
   i. The lower level has southern orientation, so we are showing a covered porch along the entire length (essentially an extension of the mono-pitch roof). This will help control solar gain in summer, while also providing a desirable in-between space with shade and shelter right off classrooms.
   ii. The upper level has northern orientation (and good distant views, we anticipate). The highest part of the monopitch roof is on this side, which is appropriate to allow generous amounts of daylight into the rooms, without concern for excessive solar gain. The higher roof will also provide shade for much of the day just outside the building (though other shade structures will be recommended further out in the playgrounds).

3. Wind considerations
   i. We are mindful of the winds typical of this location which could make outdoor play less appealing than in many regions. We understand that the most severe winds are from a generally southwesterly and westerly direction. A number of design strategies are suggested in the concept.
   v. Natural topography: The building is situated on the southern side of a hill, with another hill to the southwest. The lower level outdoor spaces will be protected from the brunt of western winds by this higher topography which shelters the lower play areas (to be confirmed with actual topo survey).
   w. For the upper level, we are indicating wind breaks in the form of wind fences and/or trees to reduce wind from the west. A hillock is indicated to the north (about 8-10’ taller than the playgrounds) which could mitigate northern winds (again to be confirmed with actual topo.)

G. Sustainability

1. Ventilation
   i. The offset, stepped section and large monopitch roof encourage through ventilation in the building. Windows can be opened at both levels, inducing natural ventilation, whether by the Bernoulli (Venturi) Effect, Stack Effect, or just through breezes. This basic concept could be made more sophisticated with additional controls, etc.

2. Cooling
   i. As described above, there are opportunities to incorporate passive cooling through ventilation.

3. Passive solar
   i. The porch on the south side can be calibrated to optimize solar heating in winter and shade to avoid overheating in summer.

4. Renewable energy
   i. The large south pitch on the roof could be ideal for both PV and hydronic solar harvesting.
   ii. A local wind farm could take advantage of the exposure to prevailing winds on-site, and also be a teaching tool

H. Potential for Phased Construction

1. One advantage to the basic organization of this concept is the ability to phase construction based on budget or other requirements. For example, the linear arrangement of the building would allow for extension beyond to the west if preferred. Perhaps more relevant, the configuration also allows for something less than the entire building to be constructed first, with completion in a subsequent phase. This could be readily accomplished by shifting the
courtyards on the upper and lower levels to align with one another (and capturing the number of classrooms the budget will afford to the east of the courtyards). With this arrangement, the first phase would end at the courtyards, and the second phase would continue beyond the courtyards, with minimal disruption of the existing first phase occupancy.
IV. Conceptual Design

b. List of Drawings

The following is a summary of the drawings describing the conceptual design for the LCDC.

A. LC/01: Locus Plan
   i. This diagram illustrates the proposed site location in the larger context of Laramie, Wyoming.

B. SK/01: Site Plan
   i. Shows site and building layout overlaid on the Gunnerson property. Topography has been approximated.

C. SK/02: Floor Plans
   i. The two levels of the two story building are shown. Note that the upper level includes a partial roof plan over the lower level.

D. SK/03: Roof Plan, composite diagram, and section diagrams
   i. The “composite diagram showing overlapping levels” is hatched to illustrate the overlap between upper and lower levels.
   ii. The roof plan shows the large monopitch roof and various shed dormers.
   iii. This section diagram suggests how spaces are either discreet or shared between the two levels.
   iv. This section diagram illustrates how the double-height space might look at the Piazza, along with an indication of how the south facing shed dormers would admit daylight to all rooms.

E. SK/04: Programmatic Diagram Floor Plans
   i. These colored plans show very fundamentally how the design is organized by different general types of spaces.
      1. Yellow indicates common, shared and circulation spaces
      2. Blue indicates classrooms
      3. Grey indicates service and support spaces
      4. Green indicates outdoor playgrounds.

F. SK/05: Daylight Study
   i. This plan is intended to suggest how daylight will enter the building and provide natural lighting to most spaces. As a diagram, it is an abstraction and should not be taken as depicting literal cutoffs of sunlight penetration.
      1. The lighter yellow indicates daylight coming into spaces from exterior windows/doors as well as from dormers (see south side of upper level rooms which receive sunlight from dormers and clerestory windows)
      2. The darker yellow indicates double-height spaces, which also benefit from sharing of daylight from dormers above.

G. SK/06: Floor Area plans
   This plan illustrates the areas that make up the concept layouts. These will be used in future design phases to reconcile program, design and budget goals for the project.

H. SK/07: Phasing plan
   This plan illustrates a possible way to phase construction of the project. As discussed, the concept layout can be adjusted to target a building scope that corresponds to the budget that the LCDC has for development. The courtyards would be a natural place to terminate the
first phase of construction, as future expansions would have the least impact on the occupied building and the least cost impact as well.
UPPER FLOOR AREA = 11,740 SF
LOWER FLOOR AREA = 14,210 SF
GROSS AREA = 25,950 SF
LOWER PORCHES AREAS = 2,168 SF

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LARAMIE CDC FEASIBILITY STUDY
FLOOR AREA PLANS
Scale: AS NOTED
Date: 04.12.11
SK-06
V. Conceptual Cost Estimate

A conceptual construction cost estimate was generated by GE Johnson for the project, based on the conceptual design sketches.

A summary of the estimate is attached.

Combined Facility Benefits

Also attached is a diagram (SK/08 illustrating common spaces that the two programs may be sharing within the facility. These have been identified to illustrate cost savings and economies of scale anticipated by combining the two programs in one facility. A discussion follows.

There are several economic advantages of combining the two child care providers in one facility. One facility will reduce the need for duplicate portions of the building such as a parking lot, playgrounds and other site development, kitchen space and equipment, mechanical space and equipment, lobby and reception space, conference rooms, multipurpose space (Piazza), adult restrooms, Atelier, kiln and corridors.

This shared space accounts for approximately one third of the facility and amounts for about $3,100,000. of building construction cost (see attached analysis). In separate buildings for separate programs, these spaces might be somewhat smaller because they’d be serving smaller populations. However, they wouldn’t be half the size shown (for example, a commercial kitchen would likely only be slightly smaller), or if they were, their valued would be greatly diminished. For example, the Atelier and Piazza spaces are intended to be used by different groups at different times, but not with fewer children per use. So these spaces would likely be targeted at about the same size for each separate program.

From this analysis, it is likely that there is a several million dollar first cost savings by combining the two programs in one facility.

Beyond first costs, savings are realized in a combined facility in reduced operating and maintenance costs (which are approximately 5 times the construction over the life of a building). Further, there are other cost savings such as reduced staffing, cleaning, etc.
## Laramie Childrens Learning Center

### Budget Pricing Exercise

**REV 2, April 28, 2011**

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### Cost Breakout

<table>
<thead>
<tr>
<th>Sys</th>
<th>Description of Work</th>
<th>Gross Area (sf)</th>
<th>Sitework sf</th>
<th>Building 25,000 sf</th>
<th>25,000 BSF</th>
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<tbody>
<tr>
<td>1</td>
<td>Demolition</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>2</td>
<td>Site Work</td>
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<td>375,000</td>
<td>375,000</td>
<td>$15.00</td>
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<td>3</td>
<td>Foundations</td>
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<td>196,750</td>
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<td>4</td>
<td>Superstructure</td>
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<td>475,000</td>
<td>475,000</td>
<td>$19.00</td>
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<td>5</td>
<td>Exterior Skin</td>
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<td>1,050,000</td>
<td>1,050,000</td>
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<td>6</td>
<td>Roofing</td>
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<td>312,500</td>
<td>$12.50</td>
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<td>7</td>
<td>Interiors</td>
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<td>850,000</td>
<td>$34.00</td>
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<td>8</td>
<td>Conveying</td>
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<td>$2.70</td>
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<td>9</td>
<td>Commercial Kitchen (equip/plumbing/HVAC)</td>
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<td>10</td>
<td>Fire Protection</td>
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<td>13</td>
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<td>14</td>
<td>General Conditions &amp; Site Requirements</td>
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<td>466,250</td>
<td>$18.65</td>
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</table>

**Subtotal Systems**

- $923,856
- $6,224,250
- $7,148,106

### Suggested Contingency's

- **Estimating Contingency (3%)**
  - 27,716
  - 186,728
  - 214,443

- **Construction Contingency (3%)**
  - 27,716
  - 186,728
  - 214,443

### Indirect Costs

- **City Imposed Impact Fees**
  - By Owner

- **Site Development Fees**
  - By Owner

- **Water Connection Fees**
  - By Owner

- **Electrical Primary Fee**
  - By Owner

- **Construction Materials Testing & Inspections**
  - By Owner

**Subtotal Direct & Indirect Costs**

- $1,062,434
- $7,157,888
- $8,220,322

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**Total Construction Costs**

<table>
<thead>
<tr>
<th>Unit Cost</th>
<th><strong>1,062,434</strong></th>
<th><strong>7,157,888</strong></th>
<th><strong>8,220,322</strong></th>
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<tbody>
<tr>
<td>$1.95 /sf</td>
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<td>$1,298,554</td>
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<td>$286.32 /sf</td>
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<td>$344,912</td>
<td>$2,327,504</td>
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**Other Project Costs**

- **Preconstruction Services**
  - By Owner

- **Preconstruction Reimbursable**
  - By Owner

- **Design & Engineering Fees**
  - By Owner

- **Owner's Project Contingency**
  - By Owner

**Total Construction Cost**

- $1,062,434
- $7,157,888
- $8,220,322

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**Breakouts of estimated costs are provided for accounting and evaluation purposes only.**
VI. Recommendations

We recommend that the LCDC pursue the following steps:

Further due diligence on the preferred site to establish viability and prospective costs. This due diligence should include:
- Topographical survey of proposed part of site for acquisition and development (preferably at 1’ contours).
- Establishment of proximity to utilities that could service the site.
- Research on any zoning or other legal hurdles that may impact proposed development.
- Research on requirements for site plan approvals, etc.

Evaluation of funding sources and availability to establish a budget for the project.
- The goal of this step is to identify what level of funding may be available to proceed with construction. The budget, along with a cost estimate, should enable the LCDC to revisit the program to establish whether the entire project can be built at once or if a reduced program should be targeted (with possible later phases). If a reduce program is necessary, then the next step would be to prioritize spaces and square foot allocations.

Refine the design based on additional information developed in the above steps.

Establish concurrence of goals, budget and site availability.
- Check estimates of construction cost should be developed in conjunction with design refinements to assure the LCDC that the design evolution is within the budget goals.

Proceed with full design, documentation and construction of facility.
- Once a program, schematic design and budget are in agreement, then full design and documentation can be produced, followed by bidding and construction of the new facility.