

Ilsley Public Library Feasibility Study

June 2017

Prepared For:
Town of Middlebury—Ilsley Public Library
75 Main Street
Middlebury, Vermont 05753

By:



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1. EXECUTIVE SUMMARY

Ilsley Public Library Feasibility Study **gbA Architecture & Planning** **Introduction**

gbA Architecture & Planning participated in dozens of conversations and meetings with members of the Library Building Committee, Ilsley staff, engineers, historic preservationists, and town officials. gbA also attended a large community meeting on Nov. 10, 2016, where local citizens toured the building, completed questionnaires on the library's most pressing needs, and then broke into small groups for discussion. gbA concluded that Ilsley requires approximately 6500SF of additional space and major re-configuration of the existing square footage.

FINDINGS

I. Ilsley Public Library is composed of three pieces, which have not been altered or up-graded in 30 years. The original 1924 structure provides approximately 8,400SF on four levels including the basement. It is constructed from excellent materials and is an architectural highlight of downtown. The 1977 addition, which faces the new Municipal Building, has four levels, 2200SF, and provides at-grade access to an elevator and staircase serving all floors, two public restrooms, and a staff kitchen. The 1988 addition added approximately 8600SF on three levels and brings the total square footage to about 19,000SF. The 1988 addition contains the community meeting room, adult stacks, adult computer area, and a two-story reference room with a bowed window facing Main Street.

II. All three components of the library are structurally sound. However, each poses significant issues. The foundation of the 1924 building leaks and causes moisture problems in the basement, where the community room and nearly all of the children's facilities are located. The beautiful exterior of the original building is almost completely hidden from view by the '77 and '88 additions, and the interior needs restoration. The at-grade entrance in the 1977 addition is cramped and uninviting. It is out of sight of library staff and just steps away from the children's area. Its elevator has reached the end of its life and does not meet current accessibility standards. Its two single-person restrooms are isolated, in disrepair, and often used for inappropriate purposes.

- Architectural shortcomings of the 1988 addition include:
- Low ceilings in the big meeting room, which restrict use of spaces and make it impossible for any cinematic materials to be viewed effectively.
- The large meeting room is not flexible and cannot be reconfigured into multiple spaces that could be sized for different events.
- Complex, rigid, cell like structural system allows almost no flexibility for modifications of how services are delivered.
- Connections and openings from the 1988 addition to the original building are tight and do not allow easy flow from one to the other.
- There is no accessible Main Street entrance.
- The mechanical system is antiquated and, in some cases, not working.
- There is no operating ventilation system resulting in poor indoor air quality.
- The addition engulfs the original building and obscures a significant Main Street view of the 1924 building.
- Due to the layout, it is hard to monitor with current staffing.
- Other than the garden, there is no exterior space for groups to assemble.
- There are no public restrooms.

III. The land owned by Ilsley is limited to the footprint of the existing 19,000 SF building plus approximately 2050SF of open space north of the 1988 addition and behind the Main Street building, which houses a travel agency and nail salon.

- IV. Functionally, Ilsley’s greatest needs are:
- More dedicated spaces to serve children from preschool through high school. That programming should consist of four distinct, age-appropriate spaces that are unobstructed, well ventilated, safe, and naturally lit.
 - Necessity to move children away from an unmonitored entrance and the poorly lit, damp, cramped, leaking basement, where lines of sight are obstructed by numerous posts..
 - Safe, inviting at-grade entrances from Main Street and the rear parking area that are within sight of the circulation desk.
 - Efficient, reliable HVAC system to provide mechanical ventilation (there is none now) and to replace the hodge-podge heating systems and ten problematic A/C units.
 - Enhanced spaces for computers, digital instruction, and media lab with updated wiring.
 - Modern, efficient elevator.
 - Adequate, safe public restrooms.
 - Structurally flexible building to accommodate evolving programmatic developments.
 - Larger community meeting room free of moisture problems, served by an entrance within sight of the staff, with a ceiling high enough to project video and cinematic materials effectively, and fully wired for technology.
 - Modern and expanded wiring for technology throughout the building.
 - Accessible, more visible space for MCTV and media lab.
 - Improved, efficient lighting throughout the library.
 - Assortment of spaces for quiet reading and small group meetings.
 - Greater storage for children’s materials and janitorial supplies.
 - Better signage.

* * * *

After thorough consideration of the issues above and consultations with library staff, the Library Building Committee, and other community members, gbA presented four design concepts. Three of these were less desirable, and their best features were incorporated into the fourth concept. The cost of constructing a new library at another site was also estimated and rejected due to high costs and inconsistency with Middlebury’s determination to strengthen its existing downtown.

CONCLUSIONS

- I. To utilize the existing site and provide a library that meets both the current needs of the greater Middlebury community and allows realistic flexibility to accommodate the ways future services may be delivered, all parties agreed that the best and most feasible solution involves:
- Removal of both the 1977 and 1988 additions.
 - Excavation of the perimeter of the original building and waterproofing of its foundation.
 - Construction of an approximately 14,000SF addition that respects the historic nature and prominence of the original structure and its gardens.
 - Relocation of the children’s area from the existing basement to new sunlit spaces on the 2nd floor of the addition.
 - Placement of the new construction sufficiently to the east of Main Street to facilitate the construction of an accessible at-grade entry
 - Existing parking remains unchanged.
- II. Removal of these additions was an agonizing, but finally unanimous, decision driven by the limitations of the earlier additions, the tight building site, the goal to provide a solution that will serve the needs of the community for 50-100 years, and a commitment to invest the community’s resources in a long-term, comprehensive solution, rather than in partial alterations that would require further modification and investment over the next 10-15 years, which would, even then, be unlikely to address the full range of issues presented by the existing structure.
- III. The chosen design concept meets all of the needs in Section IV above.

2. PROJECT DESCRIPTION

gbA was asked by the Town of Middlebury to determine the feasibility of an addition and renovation to the Ilesley Public Library (IPL). The feasibility study addresses the following:

- Analysis and evaluation of the existing library building program and HVAC and electrical systems located at 75 Main Street in Middlebury.
- Determining the extent of renovation necessary/desired at the existing library including a thorough analysis of accessibility issues as they relate to parking, circulation, building entries, interior spaces and shelving.
- Determining additional programmed space needs.
- Determining how current spaces function and how they might be improved to serve the needs of 21st century users.
- Determining what future expansion opportunities might be.
- Developing two public forum events to solicit community member ideas and support.
- Developing preliminary opinion of costs for selected direction.
- Providing graphic materials that clearly explain the solution.

gbA began work by meeting and interviewing Library Trustees, Building Facility members, and staff of IPL to discuss the project in general and to clarify major objectives. Kevin Unrath, Library Director, provided the following existing documents:

- Architectural plans for 1924 building (partial)
- Architectural plans for 1977 addition
- Architectural plans for 1988 addition
- Misc. site plans and various studies

EXISTING LIBRARY SPACES

<i>Basement</i>	
Children’s Library	1270
Large Meeting Room	1070
Play Area/Picture Books	585
Youth Library	640
Kitchen	100
Foyer	190
Support, circulation, walls, etc.	<u>2523</u>
	6390SF
<i>First Floor Plan</i>	
Reading Room/Lobby	1400
Reference Room	510
Non-fiction stacks	1660
Circulation/Control Area	250
Workroom	245
Processing/Volunteers	150
Discharge Room	100
Office	75
Support, circulation, walls, etc.	<u>1964</u>
	6354SF

Second Floor Plan

Fiction Stacks	1710
Small Meeting Rooms (2)	180
Vermont Room	400
Digital Media Lab	75
VT Reference Room	100
Staff Lounge	150
Support, Circulation, Walls, etc	<u>1521</u>
	4136SF

Third Floor Plan

MC TV Space	730
Storage	408
Support, Circulation, Walls, etc	<u>918</u>
	2056SF

The existing Basement is equal to approximately	6390
The existing First Floor is equal to approximately	6354
The existing Second Floor is equal to approximately	4136
The existing Third Floor is equal to approximately	<u>2056</u>
The existing Total	18,936SF

Existing net/gross is 37%

3. DRAFT STRATEGIC PLAN 2016

Mission Statement

Ilseley Library. Discover, Read, Create.

Ilseley Library embodies the vigor and ambition of our community: It is accessible, lively and inviting to all. The library is a hub for learning, public dialogue and quiet relaxation.

Guiding Principles (See Ilseley Public Library Draft Strategic Plan 2016 for additional information)

Ilseley is Middlebury's hub for reading, technology and community.

Ilseley is welcoming to all.

Ilseley enriches the lives of children and youth.

Ilseley enriches the lives of adults, especially seniors.

Building Deficiencies

Access

- Insufficient pedestrian and vehicular access
- Inaccessible, uninviting side entrance
- Outdated elevator in need of replacement
- Icy/treacherous front steps in winter
- Heavy/awkward front door difficult to open/access
- Inadequate internal and external signage
- Lack of accessible shelving for books and non-book collections

Safety and Security

- Safety and security challenges of a four-story building with three entrances
- Unsafe and insufficient bathrooms

Space

- Lack of space for quiet and collaborative uses to coexist
- Insufficient number and location of public computers
- Lack of dedicated spaces for pre-literacy programs
- Lack of dedicated spaces for teens and tweens
- Limited storage areas for Youth Services
- No dedicated tech help/maker spaces
- Outdated, cramped public and staff space in Youth Services
- Community meeting room is overbooked, inflexible and needs technology updates
- Lack of space for janitorial and maintenance supplies
- Lack of outdoor space for programming

Modernization

- Inadequate and inefficient HVAC system
- Main sewer line failure/backup
- Lighting substandard and inefficient

BASIC PROGRAM ASSUMPTIONS

The following assumptions and goals are to be applied to all programmatic areas in the library:

- All public spaces will be fully accessible where feasible.
- Addition to be as energy efficient as budget permits. The existing building will be as energy efficient as reasonable considering the historic nature of interior and exterior finishes.
- All spaces to be flexible/adaptable to maximize possibility for change in response to emerging library purposes and technology.
- Addition to complement and respect the existing library and minimize visual and structural impact.
- Librarians need “eyes on” youth and children’s spaces.
- Community meeting rooms need separate entry for evening use with access to a restroom in order to maintain library security.
- The different functions and uses of the building are to be integrated with each other as much as possible.
- All areas of the library will have natural light and ventilation wherever possible.
- Reading, seating and computer areas will be “scattered” throughout to make more efficient use of spaces.
- Parking, although important, will not be addressed as part of this program.
- All collection capacity calculations in this report assume the following:
 - Current volume collections total 69,416 items (44,601 adult; 24,815 children’s)
 - Adult collections will not be increasing, but it is desirable to expand the SF dedicated to adult space in order to make room for more display shelving
 - It is anticipated that the children’s collection will grow by 5,000 items
 - Current video collections total 10,409 videos (7,435 adult; 2,974 children’s)
 - Current audio CD collections total 4,021 audio CDs (3,035 adult; 986 children’s)
 - Current print serial subscriptions total 104

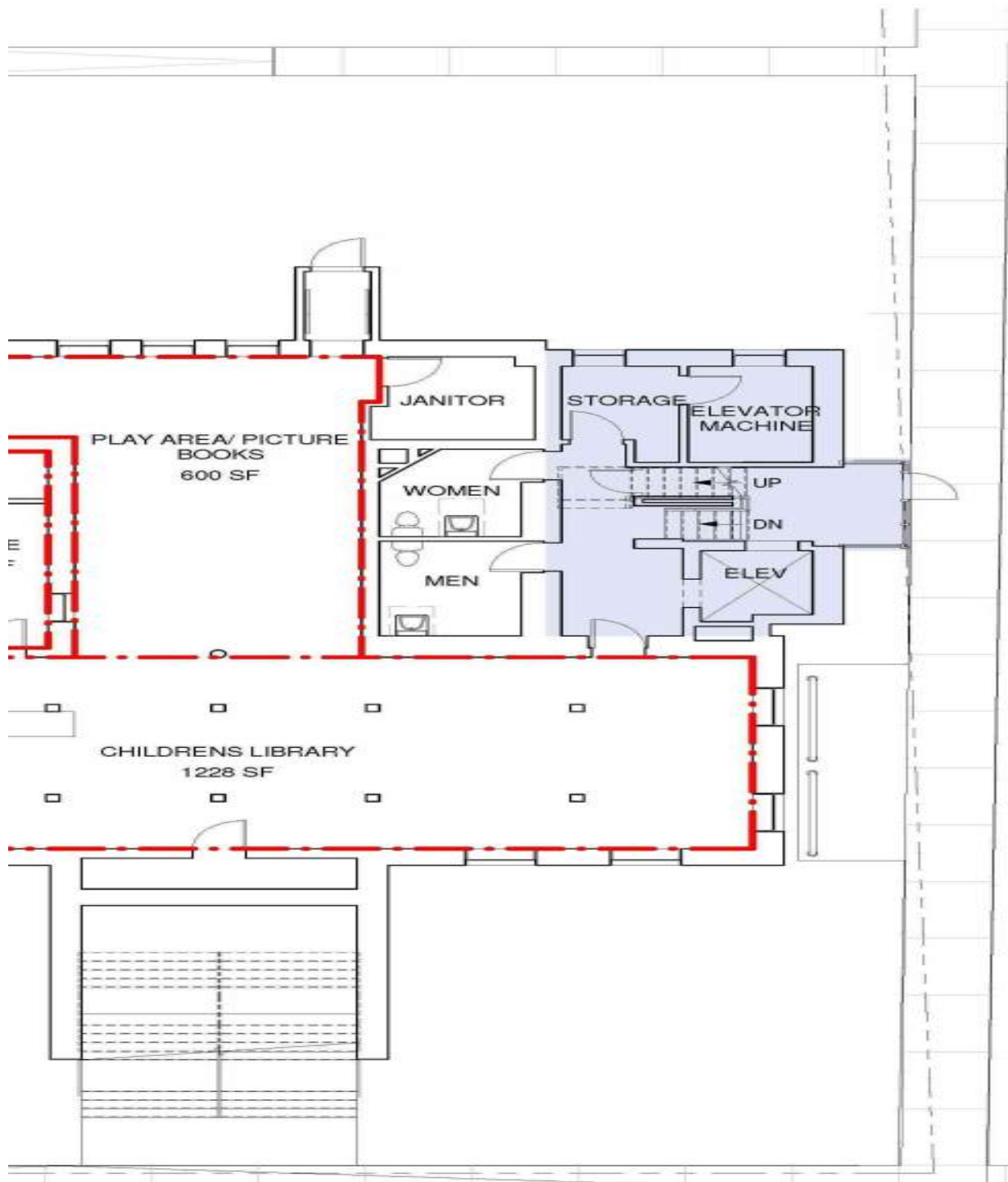
4. EXISTING PLANS

4.1 Site Plan

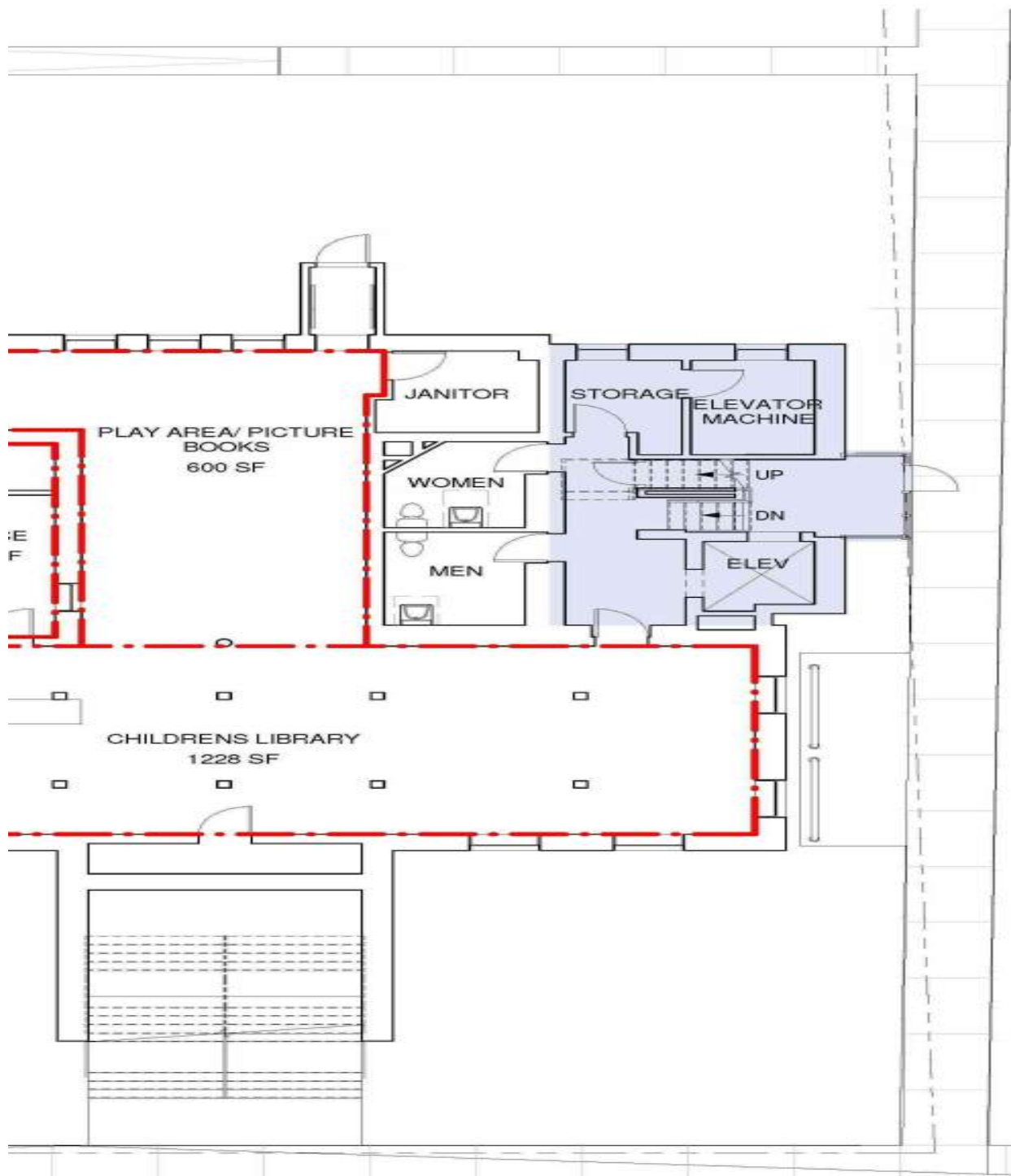


4.2 Floor Plans

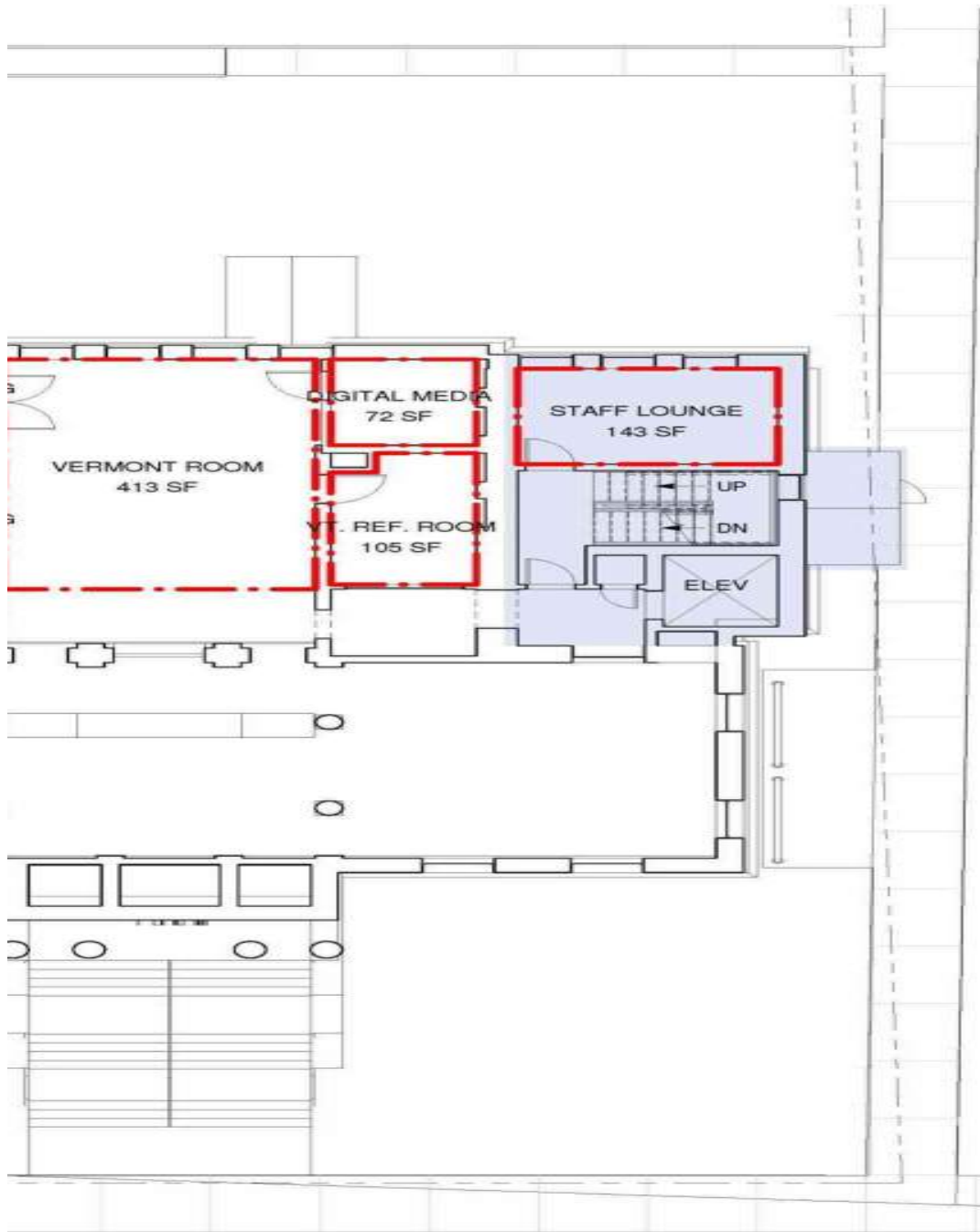
Existing Ground Floor Plans



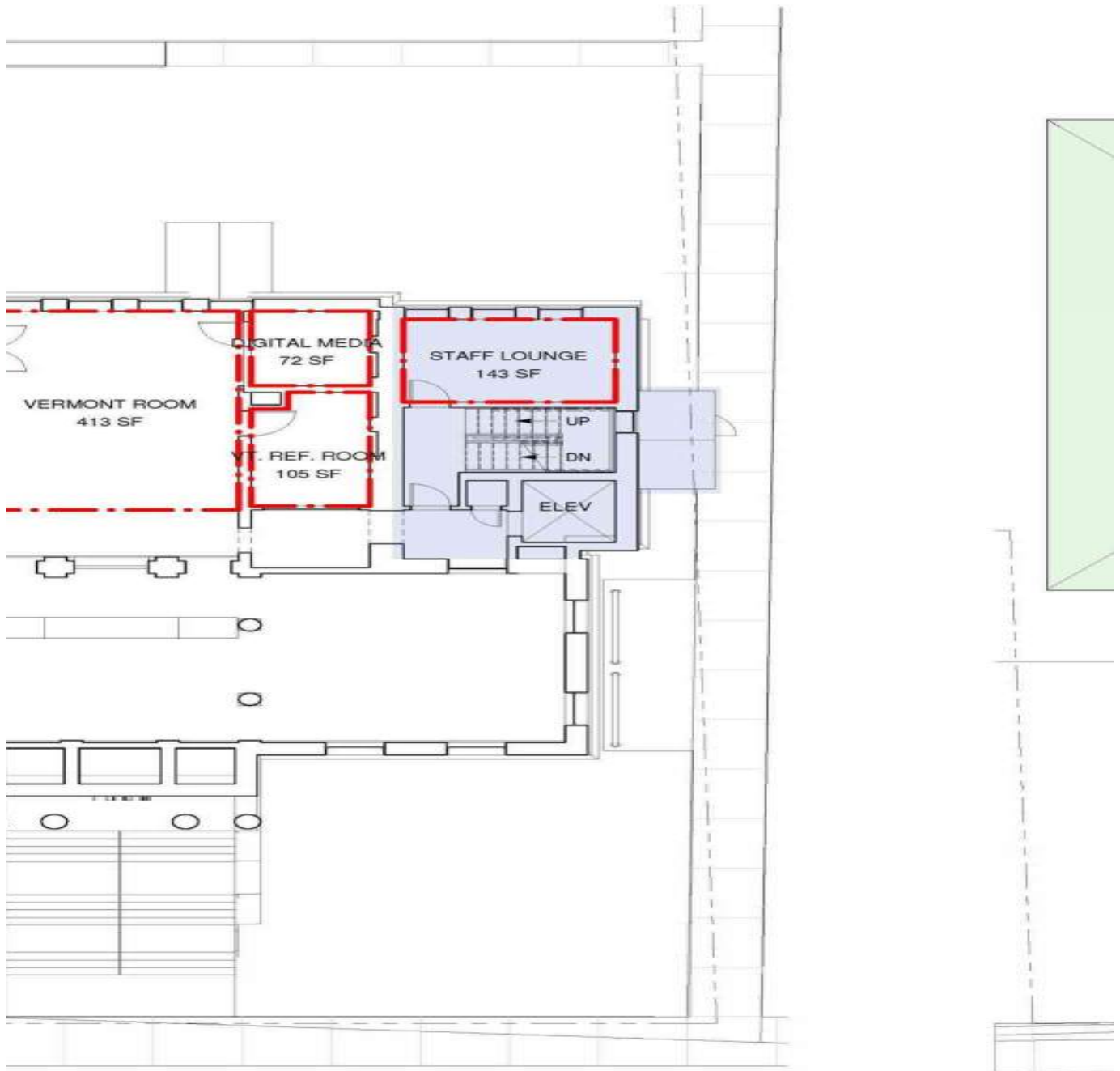
Existing First Floor Plans



Existing Second Floor Plans



Existing Third Floor Plans



5. COMMUNITY INPUT FORUM #1

5.1 Summary of Aspirational Challenges and Highlights

A community input forum was held at IPL on November 10, 2016 to gather public input on perceived library facility strengths and weaknesses. Building tours were lead by guides to learn about focus areas which included: Meeting Spaces; Children's Library; Mechanical systems; Entrances and exterior spaces; Computers and technology; Books and reading. Each station had inspirational image boards to start conversations. Feed back was solicited after the tours and priorities were voted on. The following summarizes the highlighted comments and votes from the public. Each participant was given 6 dots and asked to assign those dots to items most important to them.

MEETING SPACES (three dots)

Aspirations: Various sized spaces for flexibility; Adequate meeting spaces with appropriately sized ceilings (three dots); Maker space; Technology equipped (one dot); Spaces for casual meet ups, group work and classes. (one dot)

Current Challenges: Only one meeting room that can seat more than eight; Low ceiling, poor visibility and acoustics; Other meeting spaces in library all intrude on quite reading.

Highlights from public comments include:

- Keep meeting room entrance as is. (one dot)
- Raise the ceiling in the large meeting space. (one dot)
- Integrate buildings – do screening in town building.
- Hanover's public library with multiple meeting rooms is a nice model.
- There should be a centralized reservation desk for spaces in all town buildings.
- Is a kitchen necessary for a meeting space?
- Close circuit, overflow for first Wednesdays.
- A larger meeting room is needed.
- Other community uses could go elsewhere vs. being programmed space for the library.

CHILDREN'S LIBRARY (five dots)

Aspirations: Age appropriate programming areas (one dot); Open space for learning through play; Teens with a "space of their own" (two dots); Flexible space that can be "owned" and transformed (four dots); Browsable, child-friendly shelving (three dots)

Current Challenges: Lacks natural light; Moisture, mold issues (one dot); No lines of sight for safety (two dots); Not enough shelving; Inadequate staff space; Lack of quiet study areas; *Lack of storage(added); Too dark (added).*

Highlights from public comments include:

- Is the current space for children's library going to stay put?
- Kids are "thrown in basement – considered second class".
- Additional cubby space needed: Kellogg Hubbard has space for children to place belongings. (one dot)
- Activity use is high.
- Four separate areas are needed.
- Volunteers make it work.
- Current layout is a challenge for staff.
- Additional administrative space is needed.
- Downloadable and electronic books should be available.
- Need to get feedback from kids themselves.
- Quiet space is needed.
- There is an opportunity for collaboration with high school, middle school, student councils.
- Kids say the space is dark, noisy and smelly.

- Space is uninviting to adults.
- Stroller access is needed
- Children’s library should have immediate access from main entrance. (two dots)
- Children should be on first floor, not in the basement. (seven dots)
- Space should be on multiple levels with ramps, adequate storage and garden accessibility. (three dots)

MECHANICAL SYSTEMS (three dots)

Aspirations: LED lighting; Sustainable energy sources for heating and electricity (three dots); Electric car charging station; Excellent air quality with proper ventilation (five dots). (Note: two dots for all listed aspirations)

Current Challenges: Uninsulated walls; Windows that do not open and water intruding in places; Toilets inadequate and prone to vandalism; No ventilation; Boiler at end of useful life; Elevator, electrical need upgrades; Four story building.

Highlights from public comments include:

- Three story parking garage with library on top. (one dot)
- Standardize lighting.
- Address all HVAC equipment that has reached its end of life.
- Be careful to work within historic envelope.
- Increase number of plumbing fixtures and scatter throughout the building.
- Restrooms should be multi-stall for safety and volume. Family bathroom is important.
- Buy Greg’s market for new library. (one dot)
- Is this building worth saving? (ten dots)
- Is building committee investigating purchasing the building next door? (three dots)
- Building is not easily accessible for those with mobility issues. (two dots)
- Basement should not be used – poor air and light. (three dots)
- Bathrooms should be key accessed.
- Is the roof structure adequate for solar?
- Mechanical and electrical engineers should prioritize energy saving approaches.
- Leaking foundation.
- Look at maintenance cost vs. upgrading all systems.
- Was adjacent blasting cause of foundation shift and leaking?

ENTRANCES & EXTERIOR SPACES (one dot)

Aspirations: Inspiring views into and out of the library (one dot); Accessible, safe and welcoming entries (three dots); Electric car charging station; Integration of gardens with building; Interactive and useable exterior spaces; Service desk near the main entry.

Current Challenges: No at grade entrance; Side entrance not secure, unwelcoming, Slippery front steps in winter; Gardens cannot be enjoyed, lack of windows/views from inside

Highlights from public comments include:

- Garden is not a priority.
- Garden is important and could better be used as a learning space. (three dots)
- Is it “this” garden or “a” garden?
- Pollinators need help.
- Entrances prevent us from having a security system.
- Need ground level help.

- Book security gates needed.
- Maintain main level entry woodwork. Aesthetics are important to save. (one dot)
- Address heavy front door.
- Economics achieved by sharing with town buildings (sharing meeting spaces).
- Investigate sheltered breezeway between buildings.
- Camera/TV @ entrances.
- Do not provide an electric car charging station. (one dot)
- Address parking issues.
- Drop box outside near parking.
- MCTV is good symbiosis – is it essential?
- Main entrance from parking .
- Net zero?

COMPUTER AND TECHNOLOGY

Aspirations: Space for collaborative use (one dot); Spaces for individual use; Flexible workspace; Digital media facilities; TV studio integration.

Current Challenges: Computers in middle of stacks are disruptive; MCTV hidden on 3rd floor, help with facilities on 2nd and ground floors; Digital Media lab and Maker Spaces shoehorned into inadequate spaces; Wiring piecemeal and inflexible.

Highlights from public comments include:

- MCTV – is it necessary to stay at Ilsley? Look at Hannaford Career Center.
- Committee should do an inventory of other facilities in town so as to not duplicate spaces.
- Maybe move MCTV and computing to basement level.
- No teen/tech space.
- Spaces should all be flexible and appropriate for a variety of activities.
- There should be increased integration between MCTV and library.
- There should be adequate space for middle schoolers after school.
- Computers – are they an answer to equity?
- Home schoolers need access to technology.
- Computers are a top priority and need to follow an integrated approach. (two dots).
- Spaces should be designed for laptop use.
- There should be a designated area for teen use. (one dot).
- Tech materials should be centralized, organized and accessible (three dots).

BOOKS AND READING

Aspirations: Lower stacks; Natural light (two dots); Seating options; Quiet nooks and crannies (one dot); Appropriate artificial lighting.

Current Conditions: Lack of space for quiet, comfortable reading; Shelving too high and too low, not accessible, blocks natural light; Warehouse feeling in adult stacks; Lack of display space

Highlights from public comments include:

- Better/friendly browsing.
- Cozy spaces have decreased or are too crowded. (one dot).
- Is the library mission statement guiding this project? (one dot).
- Sight lines need to be improved.
- Abundance more important than ease of access.
- Variety of media/formats needed – books, magazines, etc. (one dot).
- Compact shelving to keep storage space
- Sufficient shelving for collections – enlarged. (three dots).

- Sufficient archive storage – VFC, Sheldon, Town, etc. (two dots).
- Table space for browsing (open book).
- Carts on casters.
- What is possible with space saving shelving?
- Kids shelving is more important than adult shelving.
- Adult reading spaces in main new area.
- Lack of space to sit and read.
- Maintain front façade.
- Can the building support an additional floor?

SUMMARY OF DOTS

- 10 dots – Is the building worth saving?
- 7 dots – Children should be on the first floor, not in the basement
- 5 dots - Children’s Library
- 5 dots – Excellent air quality with proper ventilation.
- 4 dots – Flexible space that can be “owned” and transformed.
- 3 dots – Meeting spaces
- 3 dots – Sustainable energy sources for heating and electricity
- 3 dots – Browsable, child friendly shelving.
- 3 dots – Mechanical systems.
- 3 dots – Children’s space should be on multiple levels with ramps, adequate storage and garden accessibility.
- 3 dots – Is building committee investigating purchasing the building next door?
- 3 dots – Basement should not be used – poor air and light.
- 3 dots – Accessible and welcoming entries.
- 3 dots – Adequate meeting spaces with appropriately sized ceilings.
- 3 dots – Garden is important and could better be used as a learning space.
- 3 dots – Tech materials should be centralized, organized and accessible.
- 3 dots – Sufficient shelving for collections – enlarged.
- 2 dots – No lines of sight for safety
- 2 dots – Children’s library should have immediate access from main entrance.
- 2 dots – For all aspirations listed under Children’s Library.
- 2 dots – Building is not easily accessible for those with mobility issues.
- 2 dots – Computers are a top priority and need to follow an integrated approach.
- 2 dots – Lower stacks and natural light.
- 2 dots – Sufficient archive storage – VCF, Sheldon, Town, etc.
- 1 dot – Technology equipped meeting spaces.
- 1 dot – Spaces for casual meet ups, group work and classes.
- 1 dot – Keep meeting room entrance as is.
- 1 dot – Raise the ceiling in the large meeting space.
- 1 dot – Moisture and mold issues in the Children’s library.
- 1 dot – Additional cubby space needed.
- 1 dot – 3 story parking garage with library on top.
- 1 dot – Buy Greg’s market for new library.
- 1 dot – Entrances & Exterior Spaces.
- 1 dot – Inspiring views into and out of the library
- 1 dot – Maintain main level entry woodwork.
- 1 dot – Do not provide an electric car charging station.
- 1 dot – Space for collaborative use.
- 1 dot – Space for designated area for teen use.
- 1 dot – Cozy spaces have decreased and are too crowded.
- 1 dot – Is the library mission statement guiding this project?
- 1 dot – Variety of media/formats needed – books, magazines, etc.

Total of 98 dots

5.2 Inspiration Boards



4



3



2



1



9



8



6



5

- Low Stacks
- Natural Light
- Seating Options
- Quiet Nooks and Crannies
- Appropriate Artificial Lighting



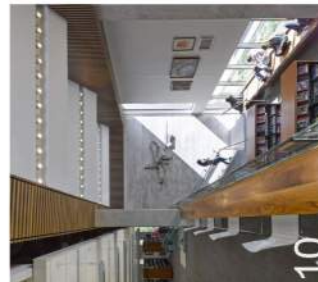
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12



11



10



BOOKS & READING

ILSLEY PUBLIC LIBRARY

November 11th, 2016





- Age appropriate programming areas
- Open space for learning through play
- Teens with a flexible "space of their own"
- Spaces that can be "owned" & transformed
- Browseable, child-friendly shelving



CHILDREN'S LIBRARY

ILSLEY PUBLIC LIBRARY

November 11th, 2016





- Collaborative use
- Individual use
- Flexible workspace
- Digital media facilities
- TV studio integration

gba
ARCHITECTURE & PLANNING

ILSLEY PUBLIC LIBRARY

November 11th, 2016

COMPUTER & TECHNOLOGY





4



3



2



1



9



8



7



6



5



10

- Inspiring views into and out of the library
- Safe and welcoming entries
- Integration of gardens with the buildings
- Interactive and useable exterior spaces
- Service desk near the main entry



13



12



11



ENTRANCES & EXTERIOR SPACES

ILSLEY PUBLIC LIBRARY

November 11th, 2016





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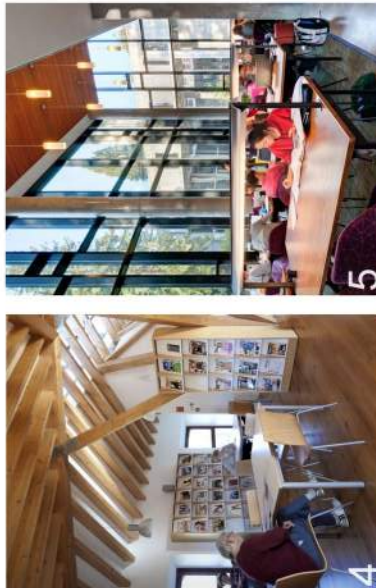
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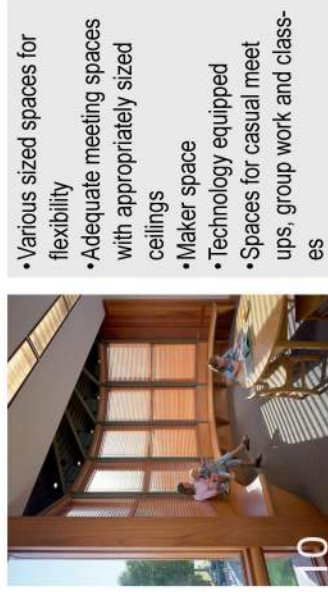
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6



5



10



9



8

- Various sized spaces for flexibility
- Adequate meeting spaces with appropriately sized ceilings
- Maker space
- Technology equipped
- Spaces for casual meetings, group work and classes

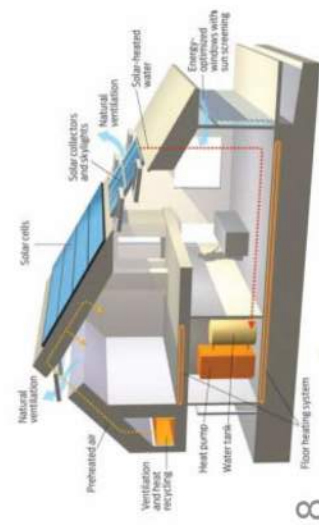
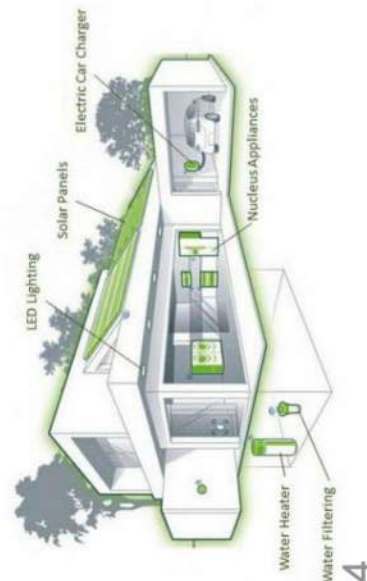
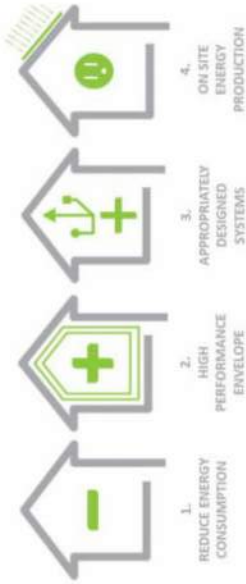
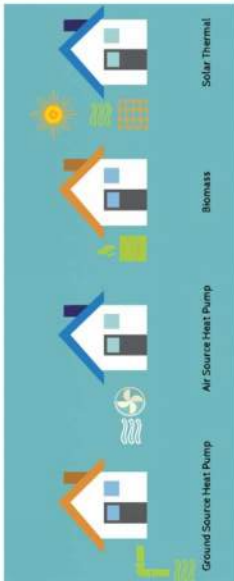


MEETING SPACES

ILSLEY PUBLIC LIBRARY

November 11th, 2016





- LED Lighting
- Sustainable energy sources for heating and electricity
- Electric car charging stations
- Excellent air quality and proper ventilation

6. PROGRAM ANALYSIS

6.1 Written program

<u>Existing Space</u>	<u>Existing SF</u>	<u>Additional Space</u>	<u>Additional SF</u>		
Current Lower Level		Related			
Foyer	180	Additional computer space	100		
Kitchen	90	Spaces for quiet and collaborative users	250		
Large Meeting Room	1055	Storage for Youth Services	200		
Youth Library	630	Space for tweens	300		
Children's Library	1230	Space for teens	400		
Play Area/Picture Books	600	Space for preliteracy program	400		
Office	170	Youth Services staff area	100		
	3955	Additional meeting spaces	500		
Supporting	2330	Expanded children's library	500		
Total Lower Level	6285		2750	30%	825
			3575	w/30%	
Current Level 1		Related			
Non Fiction Stacks	1695	Additional computer space	100		
Reference Room	600	Spaces for quiet and collaborative users	500		
Reading Rooms	895	Technology & maker space	250		
Lobby	250	Entry Lobby	400		
Circulation	260	Expanded stacks	500		
Back Periodicals	95		1750	30%	525
Office	75		2275	w/30%	
Workroom	380				
Discharge Room	95				
Processing/Tech Serv/Vol	140				
	4485				
Supporting	2035				
Total Level 1	6520				
Current Level 2		Related			
Fiction	1695	Additional computer space	100		
Small Meeting Room	75	Spaces for quite and collaborative users	500		
Small Meeting Room	110		600	30%	180
Vermont Room	410		780	w/30%	
Digital Media Lab	75				
Vt. Reference Room	105				
Staff Lounge	140				
	2610				
Supporting	1595				
Total Level 2	4205				
Current Level 3		Related			
MC TV & Office	760				
	760				
Supporting	470				
Total Level 3	1230				

6630 Additional SF

Note: Total of existing building SF = **18240**
 Total of programmed space SF = **6630**
 (35% net to gross)

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General Observations – Original 1923 Building

Basement:

The existing foundations and columns were generally hidden behind interior wall finishes. Perimeter stone foundation walls and interior brick walls, where exposed, appear to be in good condition. The 1987 addition included removal of existing interior masonry wall in the basement with a new 12" steel girder and new 10" diameter steel post and concrete spread footing. The beam framing and steel beam support on the existing interior block walls appears to be adequate with no visible signs of cracking in the basement ceiling finishes.

First Floor Framing:

The existing first floor framing most likely consists of wood decking on wood joists spanning to interior block walls and interior wood beams to posts, and exterior foundation walls. The framing is hidden from view, but based on observation of finishes, appears to be in good shape.

Second Floor Framing:

Approximately half of the existing second floor framing was removed and replaced with new tongue and groove plywood decking on new 2x8 joists and new 7"x7" steel girders as part of the 1987 addition work. Steel bearing plates at each end of the girders on the existing interior block walls were detailed for support. The area of this framing can be seen on Sheet S-3 of the existing structural drawings. The previous stair framing was removed and the stair opening was infilled with new 2x8 joist framing. The existing framing on the south end of the building most likely consists of wood decking on wood joists spanning to interior and exterior bearing walls.

The second floor framing was hidden from view but appears to be performing adequately based on observation of the existing finishes from below. Where the floor framing was replaced in 1987, the 2x8 joists spanning up to 9 feet appear to be adequately sized for the current reading/office-type live load use (60 to 80 lbs./sf), but would require reinforcing for a stacked book live load (design loads are not indicated on the existing structural drawings).

Attic Floor and Roof Framing:

The existing framing most likely consists of wood decking on wood joists and rafters spanning to interior block walls and interior wood beams to posts. The framing is hidden from view, but based on observation of finishes, appears to be in good shape.

Exterior Building Lines:

The exterior conditions of the building appear to be in excellent condition. The exterior stone walls are plumb with no signs of major cracking/settlement. The built-up roofing has been recently replaced and appears new, and the hip lines are straight.

Interior Finishes:

Drywall cracking was observed in the ceiling of the second floor at the corridor opening through the original exterior masonry wall near the elevator. This cracking, while fairly minor, may be due to some previous differential movement between the original building and the 1970's addition.

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Exterior Grading and East Ramp:

I observed surface water collecting near the overnight depository during the rain event on October 22nd. It appears the water sheds off the corner of the roof and collects on the exterior pavers in this area on the east side of the building.

The concrete ramp walls and exterior slab leading to the lower level entrance appear to be in good condition.

East Garden Bulkhead:

The CMU (concrete masonry unit) foundation walls and framing are in poor condition at the exterior bulkhead structure, and the staff members indicated water infiltration issues in the stairs and slab-on-grade area. The CMU walls have clearly shifted due to soil pressure and possibly frost movement, which in turn have moved the framed walls on top of the CMU.

General Observations – Elevator and Stair Tower Addition

The existing structural systems were generally hidden from view at the time of the site visit. Concrete foundation walls and a concrete slab-on-grade, both in good condition, were observed in the elevator machine room. The library staff did note elevator machine room experiences some water infiltration which has occurred only after the new town office building construction. To connect the addition to the original library building, openings in were made in what was the original south exterior masonry wall.

Similar to the exterior walls of the original library building, the exterior marble stone walls for this addition appear to be in excellent condition with no signs of major cracking or settlement.

General Observations: 1987 North Addition

The existing structural systems were generally hidden from view at the time of the site visit except for a few areas, which confirmed the framing shown on the existing 1987 addition drawings which include (from Sheets S-1 through S-4):

- Basement: 4" thick slab-on-grade and interior steel columns supported by concrete spread footings. At the "pass-thru" from existing to the addition space, 10" diameter steel pipe columns and spread footings were detailed to support the exterior stone wall left in place above the first floor. A perimeter 15" thick concrete foundation wall and strip footing supports perimeter 8" CMU bearing walls and split face CMU veneer, with concrete pier reinforcing at perimeter steel column locations.
- First and second floor framing: concrete slab on metal deck spanning to steel wide flange beams and girders, steel tube columns, and a clear-spanning steel "truss unit" between the first and second floors. The steel trusses, with exposed diagonals and verticals in the current computer and stack room area, support the first and second floor framing creating an open column-free space below the first floor. The slab and steel framing sizes generally appear to be sized appropriately for a heavier stack room live load of 150 psf.

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- Roof framing: Typical 2x12 rafters and 2x8 floor joists spaced 16" on center with attic floor framing supported by 18" deep steel wide flange beams. The roof and attic framing appears to be in good condition with added insulation in a new built-up membrane in 2014.
- Lateral-resisting systems: Steel moment frames with bolted plate connections were detailed in the north-south direction at each gridline (approximately 10'-8" on center), and it appears the perimeter 8" reinforced CMU walls were designed as shear walls resisting lateral forces in the east/west direction.

Exterior Building Lines:

The exterior conditions of the building appear to be in very good conditions. The exterior split faced CMU veneer walls are intact and generally free from any visible cracking, the foundation walls do not exhibit signs of previous settlement and the roof ridge, hip, and valley lines do not show signs of sagging. One area of cracking in the exterior masonry veneer on the north side of the building is at the exterior mechanical equipment and pad and may be due to shrinkage cracking combined with the attachment of the mechanical equipment.

Interior Finishes:

Drywall cracking was observed in the soffits and walls around the second floor opening overlooking the reference room. Causes of the cracking could be thermal variations or previous water infiltration; there did not appear to be signs of movement due to deficient floor or roof framing translating out into the framed-out soffit.

Vertical drywall cracking was also observed in the walls around the window openings on the east end of the second floor. The cause of this cracking is most likely the larger thermal variations associated with morning heating around that space from the east-facing windows. The cracking seemed to be limited to the corners of the opening and

Recommendations for Future Renovations/Additions

This structural evaluation is intended to assist in considering options for renovations and/or additions to the existing library with the following recommendations:

Existing Building Seismic Considerations

The existing building is exempt from current building code seismic requirements in its current use as a library. New alterations to the existing original 1923 structure and 1970's elevator/stair tower expansion involving removal of the existing interior stone/masonry walls could trigger a seismic code study and seismic upgrades which typically involves significant cost and design complications. These walls include the east-west running wall opposite the elevator corridor, and the north-south running wall separating the elevator tower from the original building; the original exterior building walls. I recommend avoiding alterations that would increase the seismic demand on these walls to avoid a code-mandated seismic upgrade.

Existing Building Floor Use Considerations

Since the load capacity of primary first floor framing members was not confirmed, the floor framing may require reinforcing if the current reading and reference rooms were

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converted to stack rooms with a higher live load requirement (150 psf). The area of existing second floor replacement during the 1987 addition appears to be limited to its current reading room use live loading. I recommend keeping the open reading, reference, and study rooms to a similar lighter live load use compared to heavier stack room areas, to avoid potential reinforcing of the existing floor systems.

New Building Addition Considerations

Any substantial additions to the north or east of the existing structure would most likely be designed independently with expansion joints at the interface of new and existing structures in part to avoid code-mandated evaluations and structural upgrades to the existing building. A lighter glass entry addition to the west could be designed to tie into the existing building, imposing relatively small additional gravity and seismic loads on the existing structural systems and not triggering a seismic upgrade.

New concrete foundations for building additions adjacent to and tying into the existing building should match the existing footing elevations to avoid undermining the existing foundations.

Existing Building - General Recommendations

In addition to considerations for future additions or alterations to the current library, the following recommendations to the existing building include:

- Remove the garden bulkhead foundations and wood-framed structure and fill in the existing building foundation wall, or demolish and replace the bulkhead structure with a properly constructed concrete foundation wall and footing, and wall/roof framing, designed to shed water away from foundation walls and any interior stairs leading to the basement slab.
- Around the southeast corner of the building, excavate and inspect the drainage and foundation wall. This work may involve replacing an existing footing drain or installing a drain if one currently does not exist. The foundation wall may require additional waterproofing and/or concrete crack sealing.
- Properly slope existing exterior grades away from the building on the east and north side incorporating swales off the building perimeter; in various locations, primarily on the northeast side of the building, the exterior grade appears to slope towards the building and exterior lower level entry/ramp.

Overall, the existing structural systems are in very good to excellent condition and the building has performed well over the years with proper upkeep and maintenance projects.

Thank you for the opportunity to assist your team in evaluation this important building in our local community, and please let me know if you have any questions.

Kind regards,



Greg Gellers, P.E.
Principal

7.2 MEP & Fire Protection Report—Engineering Services of Vermont



9 Washington Street
 Rutland, Vermont 05701
 802-855-8091
www.EngineeringVermont.com

October 24, 2016
 ESVT Project No. 16021

Gossens Bachman Architects - GBA
 85 Granite Shed Lane
 Montpelier, Vermont 05602

Attn: Tom Bachman, Architect, Principal
Re: Ilsley Library Renovation Project, Middlebury, Vermont
Mechanical, Electrical, Plumbing and Fire Protection Systems Report

Tom,

On September 29, 2016, we met at the project site and performed a visual inspection (non-destructive) of the mechanical, plumbing, fire protection and electrical systems serving the building. Under cover of this letter is our report on those systems including existing conditions, observed Code violations, and recommendations with construction cost estimates.

Please contact us with any questions or comments on this information.

Respectfully,
Engineering Services of Vermont

Claus Bartenstein, P.E., LEED-AP
Electrical Engineer, Principal

Enc: MEPF Systems Report

Transmitted: Via Email, only (tbachman@gbarchitecture.com)

MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION SYSTEMS REPORT

October 4, 2016 – DRAFT for Review

Applicable Code

1. Codes applicable to the mechanical, plumbing, fire protection and electrical work on this project are the Codes adopted by the Town of Middlebury, Vermont as well as the Codes and Standards adopted and amended by the State of Vermont, which include, but are not limited to:
 - a. State of Vermont, 2015 Fire and Building Safety Code
 - b. IBC-2012, International Building Code, with State of Vermont amendments
 - c. NFPA 1-2015, Fire Code, with State of Vermont amendments
 - d. NFPA 101-2015, Life Safety Code, with State of Vermont amendments
 - i. Chapter 13 – Existing Assembly Occupancies
 - ii. Chapter 37 – Existing Business Occupancies
 - e. NFPA 72-2016, National Fire Alarm Code, with State of Vermont amendments
 - f. NFPA 70-2014, National Electrical Code (NEC), with State of Vermont amendments
 - g. 2015 Commercial Building Energy Code (2015 CBES; “Energy Code”)
 - h. IPC-2015, International Plumbing Code, with State of Vermont amendments
 - i. American Society of Mechanical Engineers (ASME)
 - j. Underwriters Laboratories (U.L.)
 - k. National Fire Protection Association (NFPA) sections 13, 30, 31, 90A

Mechanical Systems

1. Existing Conditions
 - a. The Library is a four story granite and masonry block structure with an overall floor area of 16,350 square feet.
 - b. The Boiler Plant consists of an oil fired Weil McLain cast iron sectional steam boiler with a heating output capacity of 770,000 BTUH. According to boiler inspection certificates the boiler was installed in 1997 and has been in operation for 19 years.
 - c. The steam boiler supplies steam to cast iron radiators and perimeter fin-tube radiation on the first and second floor levels. A condensate receiver and pump located in a Utility Room on the basement level returns condensate back to the boiler. A steam to water shell and tube heat exchanger located in the Boiler Room provides hot water heat to the basement level. Two zone circulators pump hot water to cabinet heaters, convectors and perimeter fin-tube radiation on this level.
 - d. A variety of programmable type thermostats are located throughout the facility.
 - e. Fuel oil is supplied from a below grade fuel oil storage tank located in the Community Garden area behind the building. The age and condition of the tank are unknown.
 - f. A wall mounted louver with motorized damper provides combustion air to the Boiler Room.
 - g. There is no central ventilation system for this facility. Bathrooms are provided with exhaust grilles ducted to exhaust fans. Ceiling paddle fans located in the Main Library

on the first floor level provide air movement in this space.

- h. A Carrier air handling unit located in the Boiler Room delivers ventilation air to the Meeting Room on the basement level. This unit has a DX cooling coil, however the refrigerant piping system has a leak and is not being used.
- i. When the addition was built in 1987 two air handling units were installed in the attic area. These units delivered ventilation and air conditioning to the Main Stack areas on first and second floors. These air handling units, connected ductwork and supply diffusers and return grilles have since been removed.
- j. Air conditioning is now provided by Fujitsu split DX systems consisting of wall mount interior units and exterior condensing units. There are approximately twelve interior units and eight exterior condensing units located around the building perimeter. Refrigerant piping is routed within line hide type enclosures to conceal and protect piping.

2. Code Deficiencies

- a. Because existing air handling units were removed the facility is not being ventilated in compliance with ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality.
- b. The combustion air damper in the Boiler Room is undersized for the boiler input capacity.
- c. The Elevator Machine Room is not heated or ventilated.

3. Operational Deficiencies

- a. Comfort is an issue throughout the facility as many areas are not able to maintain acceptable heating or cooling temperatures.
- b. Lack of sufficient fresh air for ventilation leads to poor indoor air quality throughout the facility.
- c. Exhaust fans serving bathrooms did not appear to be functional.

4. Recommendations

- a. The existing heating system should be converted from steam to hydronic hot water. This conversion will improve heating system efficiency and allow better control of terminal heating equipment.
- b. The existing boiler has been in operation for almost 20 years. While a typical cast iron sectional boiler could function for 25 to 30 years it should be replaced as part of this renovation. Our recommendation is to provide two replacement boilers each sized for 60% of the peak heating load. Fuel costs and equipment efficiencies should be compared to evaluate if it is feasible to convert the fuel source from fuel oil to propane, or possibly natural gas when it is available. New boilers could be high efficiency, condensing type gas boilers similar to Triangle Tube Prestige model 399.
- c. The existing steam and condensate heating system is antiquated and should be replaced with a new hydronic hot water heating system. Existing steam radiators and unit heaters should be removed. It is anticipated that smaller office areas will be heated with perimeter fin-tube radiation, larger open areas such as Stack Areas and the Main Library will be heated with cabinet unit heaters. Heating equipment will be sized to allow the boilers to operate at 160 degrees F to improve system efficiency. New variable speed pumps with integral controls will be provided to allow pumps to respond to system heating demand. New pumps will be Grundfos Magnas or Wilo Stratus. New insulated hot water supply and return piping will be installed to supply new terminal heating

- a. Recommendations:
 - i. Convert to Hot Water Heating System (including heating coils at HRUs)
Estimated construction cost range: \$230,000 - \$250,000
 - i. Provide Ventilation System with Heat Recovery Units
Estimated construction cost range: \$60,000 - \$70,000
 - i. Provide Split System Air Conditioning Units
Estimated construction cost range: \$100,000 - \$120,000
 - ii. Provide New DDC System
Estimated construction cost range: \$40,000 - \$50,000
 - iii. Provide New 1000 Gallon Underground Fuel Oil Storage Tank
Estimated construction cost range: \$20,000 - \$25,000

Plumbing Systems

- 1. Existing Conditions
 - a. The domestic water main enters in the basement. Domestic water piping is copper and distributes throughout the building to bathroom lavatories and sinks. Plumbing fixtures appear to be outdated and should be replaced.
 - b. Domestic hot water is generated by two electric water heaters located at the basement level. One 20 gallon water heater is installed in the Boiler Room, and a second 50 gallon water heater is located in a Utility Room on the basement level. The water heater installed in the Utility Room is only five years old and can be retained, a thermostatic mixing valve is installed on this water heater. The age of the water heater in the Boiler Room is unknown, but appears to be older. There is no mixing valve installed on the water heater in the Boiler Room.
 - c. There is no hot water recirculation system installed in this facility.
 - d. Existing sanitary and vent piping is cast iron and appears to be in adequate condition.
 - e. There is an issue with an existing 3" sewer line that periodically backs up into the building. A camera of this line indicates tree roots may have penetrated the tile line.
- 2. Code Deficiencies
 - a. Domestic hot water piping distance from fixture to hot water source exceeds the allowable distance listed in the Vermont Commercial Building Energy Standard. This affects lavatories in bathrooms.
 - b. Domestic hot water piping is not insulated in accordance with current energy standards.
 - c. A backflow preventer is not provided on the domestic water service to the building.
- 3. Operational Deficiencies

- a. Maintenance complains of extremely hot water at sinks located in the kitchen area. A thermostatic mixing valve is required on the hot water supply from this water heater.

4. Recommendations

- a. Install domestic hot water recirculation piping with controls to allow the pump to operate only when the piping loop temperature drops below a set point temperature.
- b. All domestic hot water piping should be insulated with 1" thick piping insulation with a maximum thermal conductivity of 0.28 Btu-in/hr-sf-degree F. Domestic cold water piping should be insulated to prevent condensation.
- c. Replace plumbing fixtures in Bathrooms. For planning purposes there are approximately eight toilets, eight lavatories, and two urinals. Replacement of fixtures would include new supply stops, supply hoses, p-traps and tailpieces. Add drinking fountains at each floor level (total of 3).
- d. Replace the electric water heater in the Boiler Room with a new 30 gallon condensing gas water heater, possibly gas fired if natural gas is available. Provide a thermostatic mixing valve on the hot water supply.
- e. The problematic sewer line should be replaced. As this line is exterior to the building a civil engineer should be consulted for a line replacement cost estimate.
- f. Provide a double check backflow preventer.

5. Estimated Plumbing System Construction Costs

a. Recommendations:

- i. Install a Domestic Hot Water Recirculation System
Estimated construction cost range: \$5,000 - \$7,000
- ii. Domestic Hot & Cold Water Piping Insulation
Estimated construction cost range: \$2,000 - \$3,000
- iii. Replace Plumbing Fixtures in Bathrooms. Add Drinking Fountains.
Estimated construction cost range: \$50,000 - \$70,000
- iv. Provide Gas-Fired 30 Gallon Water Heater
Estimated construction cost range: \$5,000 - \$7,500
- v. Provide 1" Backflow Preventer
Estimated construction cost range: \$1,000 - \$1,500

Fire Protection System

1. Existing Conditions

- a. The facility is protected by a combination dry-pipe and wet-pipe sprinkler system which enters the building in the basement level.

2. Code Deficiencies

- a. None observed.

3. Operational Deficiencies

- a. At one time the existing dry-pipe system had a leak. New piping has since been installed.
- 4. Recommendations
 - a. Interior proposed renovations will likely require some relocation of branch sprinkler piping and new sprinkler heads.
- 5. Estimated Fire Protection Construction Costs
 - i. New Branch Sprinkler Piping and Heads
 - Estimated construction cost range: \$10,000 - \$15,000*
 - a.

Electrical Systems

- 1. Existing Conditions
 - a. Electrical Service: The service is rated 120/208V, 3 phase, 4 wire, 400 Amp. Electrical service is routed to the building underground from a pad mount, utility owned, 300KVA transformer to the south. The transformer also serves the Municipal Office Building located to the south of the Library. Utility metering is located on the transformer.
 - b. Electrical Distribution: Main electrical service disconnect is a 400 Amp fused switch which feeds an adjacent circuit breaker main distribution panel (panel MDP). Panel MDP provides feed to circuit breaker panels located in the basement Mechanical Room and second floor corridor. A 100 Amp fused disconnect located to the right of the main disconnect switch taps off of panel MDP and provides feed to a panel on the third floor.
 - c. General Power: General use receptacles exist throughout the building. Random testing of receptacles indicated that they are grounded and wired properly. Power connections exist for all mechanical and building equipment.
 - d. Wiring Methods: The wiring methods in the building are a combination of electrical metallic tubing (EMT) with individual conductors, surface metal raceway with individual conductors, metal clad (type MC) multi-conductor cable, service-entrance (type SE) multi-conductor cable and non-metallic (type NM, "Romex") multi-conductor cable. In the addition area, wiring is mainly concealed and in the original building there is a combination of concealed wiring and surface mounted wiring on masonry walls and ceiling.
 - e. Lighting and Control: General space lighting is mainly T-8 fluorescent, both linear and 6" U lamps as well as compact fluorescent ceiling and downlights. Lighting controls are manual switching in each space.
 - f. Exterior Lighting: LED downlights exist in the ceiling of the main entrance roof structure. At the main side entrance, downlights recessed in the soffit are retrofitted with fluorescent lamps. The rear door into the basement has a flood-light lamp holder with retrofit LED flood lamp.
 - g. Life Safety
 - iv. Fire Alarm: A zoned fire alarm system (Simplex) exists with the main control panel located in the Staff area behind the main circulation desk. The control panel includes voice evacuation system with microphone input. Alarm is initiated manually via pull stations at egress doors and automatically via smoke detectors throughout the building and sprinkler flow switch. There is alarm (audible voice alarm and visual) signal coverage throughout the

- building. Doors in the north stair tower are on magnetic holders such that they automatically release and close upon fire alarm. There is a separate digital communicator located in the Staff area that sends alarm signal offsite to a constantly attended location.
- v. Emergency Lighting: Emergency lighting exists in the building utilizing battery pack units with light heads. It appears that coverage is fairly good, and spot checking (pushing the test button) indicates that approximately half are operational.
 - vi. Exit Lighting: Exit lighting coverage exists throughout the building, appearing to provide proper marking of the egress pathways through the building. Most signs have integral battery power, although some do not. Spot checking (pushing the test button) indicates that approximately half are operational.
 - i. Telecommunications: Telecommunications services are underground from the utility pedestals to the south, located in the vicinity of the utility transformer. The cabling enters the building through the south wall of the elevator machine room and routes through the building to a rack (punch down) located in the Staff Area behind the main Circulation Desk. Telecom wall devices appear to be located at workstations where telephones and desktop computers are utilized. There appears to be complete building coverage of wireless internet available with wireless access points (WAPs) located throughout the building.

2. Code Violations

- a. Open knock-outs in electrical boxes and enclosures
- b. The 3-phase panels are labeled as 120/240 Delta which is no longer true, the service to the building is 120/208V, 3-phase Wye configuration.
- c. Main Service Switch and Panel MDP (Main Electrical Room): Storage in front of electrical equipment including book return chute, open circuit breaker spaces causing exposed energized parts, requires circuit directory
- d. Panels B and D (Mechanical Room): Storage in front of electrical equipment, open circuit breaker spaces causing exposed energized parts, pressurized piping routed through Code required clear space above panels
- e. Panel C (2nd Floor): requires circuit directory
- f. Panel MCTV (3rd Floor): Inadequate Code required workspace due to equipment racking installed in front of it
- g. Panel AC (3rd Floor): Storage in front of electrical equipment
- h. Non-metallic cable (type NM, "Romex") is not an acceptable wiring method in an Assembly Occupancy
- i. It was reported that there is at least one overloaded branch circuit in the building. A circuit breaker which serves both the kitchenette and the MCTV area trips when the micro-wave is operated.
- j. It was reported that the same circuit "hums" on occasion (supposedly at 3rd Floor in MCTV area); this could be caused by a short in the wiring which could also be causing the tripping of the circuit breaker noted, above.
- k. GFCI protected receptacles are required in the unfinished portions of the basement (mechanical room, storage rooms).

- l. GFCI protected receptacles are required at the Kitchenette areas of the building.
 - m. GFCI protected receptacles are required at outdoor mechanical equipment (they do exist at some locations, but not all).
 - n. The use of extension cords is not allowed as permanent wiring and is commonly cited by VOSHA. Plug strips are considered extension cords by VOSHA. It was noted that plug strips and cords are utilized at workstations and in the Kitchenette.
 - o. Fire Alarm System:
 - i. Signal coverage is not complete; there appears to be visual signals lacking in several areas of the building.
 - ii. No smoke detector in the elevator machine room and at one of the elevator landings.
 - iii. There does not appear to be elevator recall as there is no smoke detector in the elevator machine room and at one landing. Also, it did not appear that there was a supervised fire alarm relay at the elevator equipment sending signal from the fire alarm system to the elevator controller to initiate recall.
 - p. Exit signage: Egress pathways should be verified with Architect to ensure proper marking; there appears to be lack of coverage on the third floor and in the racking areas. During the course of inspection, we spot tested the battery operated equipment; approximately 50% of the exit signs tested through our spot testing efforts during site inspection were not operational. Where testing indicated the batteries to be working, given the age of the equipment it is highly likely that it will run on batteries for 90 minutes as required by Code. There are exit signs which do not have an emergency component for self-powering during a loss of normal power.
 - a. Emergency Lighting: Emergency lighting coverage appeared to be lacking on the 3rd floor and in the racking areas. During the course of inspection, we spot tested the battery operated equipment; approximately 50% of the exit signs tested through our spot testing efforts during site inspection were not operational. Where testing indicated the batteries to be working, given the age of the equipment it is highly likely that it will run on batteries for 90 minutes as required by Code.
 - b. The Elevator Machine Room is not allowed to have anything in it except equipment and services serving the elevator. The telecom service routed into and through the Elevator Machine Room is a Code violation.
3. Deficiencies
- a. The building has experienced problems due to brown-out conditions which occur off-site on Green Mountain Power lines. In particular, MCTV has had a server destroyed due to one of these occurrences. Proper surge arresting equipment may provide protection from over/under-voltages which cause current surges and sags.
 - b. The fire alarm smoke detectors appear to be original to the 1987 construction making them almost 30 years old. Likely these smoke detectors have 30 years of dust/dirt build-up in their sensing chambers causing them to be minimally effective.
4. Recommendations
- i. Electrical Service and Distribution Equipment: Provide proper labeling of voltage on all equipment, provide closure plates on all open circuit breaker spaces and knock-outs, clear all storage from in front of equipment, provide complete circuit

- directories, provide shielding at piping located above Panels B and D, move Panel MCTV from behind racking.
- ii. Replace all non-metallic cabling with multi-conductor metal clad (type MC) cable or individual conductors in metallic raceway.
- iii. Divide circuits which are experiencing overload.
- iv. Investigate "humming" circuit for potential short.
- v. Replace standard receptacles with GFCI type in unfinished areas of the basement and at Kitchenettes.
- vi. Provide GFCI receptacle with weatherproof cover at outside mechanical equipment where it is missing.
- vii. Add receptacles at workstations and in Kitchenettes to avoid use of plug strips.
- viii. Add visual fire alarm signals to spaces where there is no coverage.
- ix. Add smoke detectors in elevator machine room and elevator lobbies. Provide interlock with elevator controller to provide signal for elevator recall to occur.
- x. Replace all existing exit signs with new and provide additional in areas without coverage.
- xi. Replace all existing emergency lights with new and provide additional in areas without coverage.
- xii. Rework the telecommunications service into the building so that it is not routed through the elevator machine room.
- xiii. Provide a surge protective device (SPD) at Panel MDP.
- xiv. Replace all smoke detectors.
- xv. Although the existing fluorescent lighting is fairly efficient and the building likely meets the present State Energy Code for lighting power density, there are many locations where adding automatic lighting control devices could result in significant energy savings. We recommend that Efficiency Vermont be teamed with to perform an evaluation of the existing systems which would identify potential controls, potential savings, cost to implement and simple payback.

5. Estimated Electrical Construction Costs

a. Code Items:

- ii. Electrical Service and Distribution: provide corrections as identified in "Recommendations"
Estimated construction cost range: \$3,500 - \$4,500
- iii. Wiring Methods: replace non-metallic cabling
Estimated construction cost range: \$8,000 - \$10,500
- iv. General Power: divide overloaded circuit
Estimated construction cost range: \$2,000 - \$4,000
- v. General Power: investigate and repair "humming" wiring
Estimated construction cost range: \$1,500 - \$2,000
- vi. General Power: replace standard with GFCI receptacles

Estimated construction cost range: \$500 - \$750

- vii. General Power: investigate and repair "humming" wiring

Estimated construction cost range: \$1,500 - \$2,000

- viii. General Power: add receptacle at outdoor mechanical equipment

Estimated construction cost range: \$350 - \$500

- ix. General Power: add receptacles to Kitchenettes and Workstations

Estimated construction cost range: \$2,500 - \$2,500

- x. Life Safety: add visual signals to locations without

Estimated construction cost range: \$6,000 - \$7,000

- xi. Life Safety: add smoke detectors and elevator recall connections

Estimated construction cost range: \$8,000 - \$10,000

- xii. Life Safety: replace all non-working exit and emergency

Estimated construction cost range: \$4,500 - \$5,500

- xiii. Telecommunications: rework telecom service into building and remove from elevator machine room

Estimated construction cost range: \$5,500 - \$8,000

b. Deficiency Items:

- xiv. Electrical Service and Distribution: provide surge protection device at Panel MDP

Estimated construction cost range: \$2,000 - \$2,500

c. Recommended Items:

- i. Lighting: provide automatic lighting controls (occupancy sensors, daylight controls)

Estimated construction cost range: \$8,000 - \$10,000

- ii. Life Safety: replace all smoke detectors

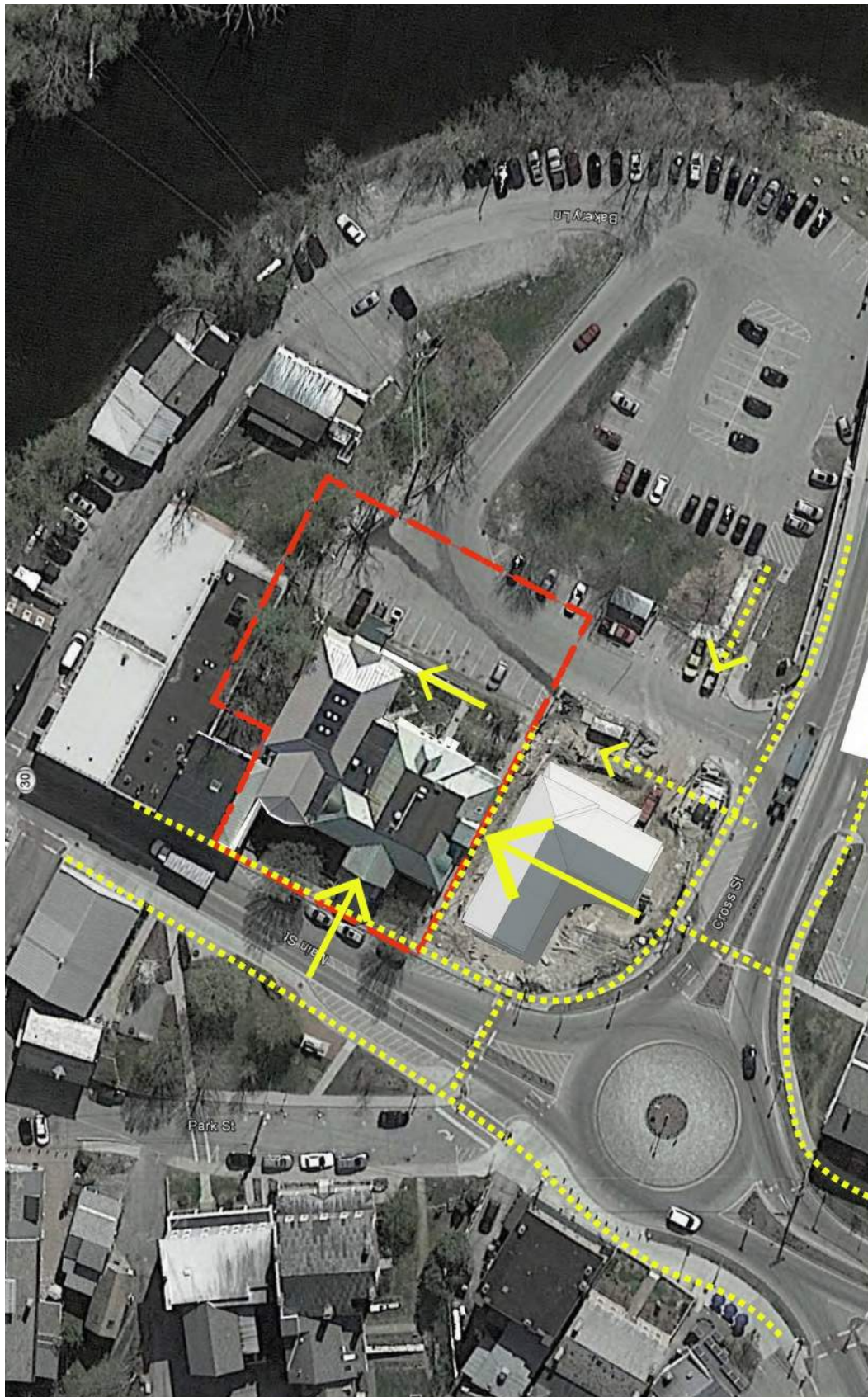
Estimated construction cost range: \$6,500 - \$8,000

6. Proposed Renovations

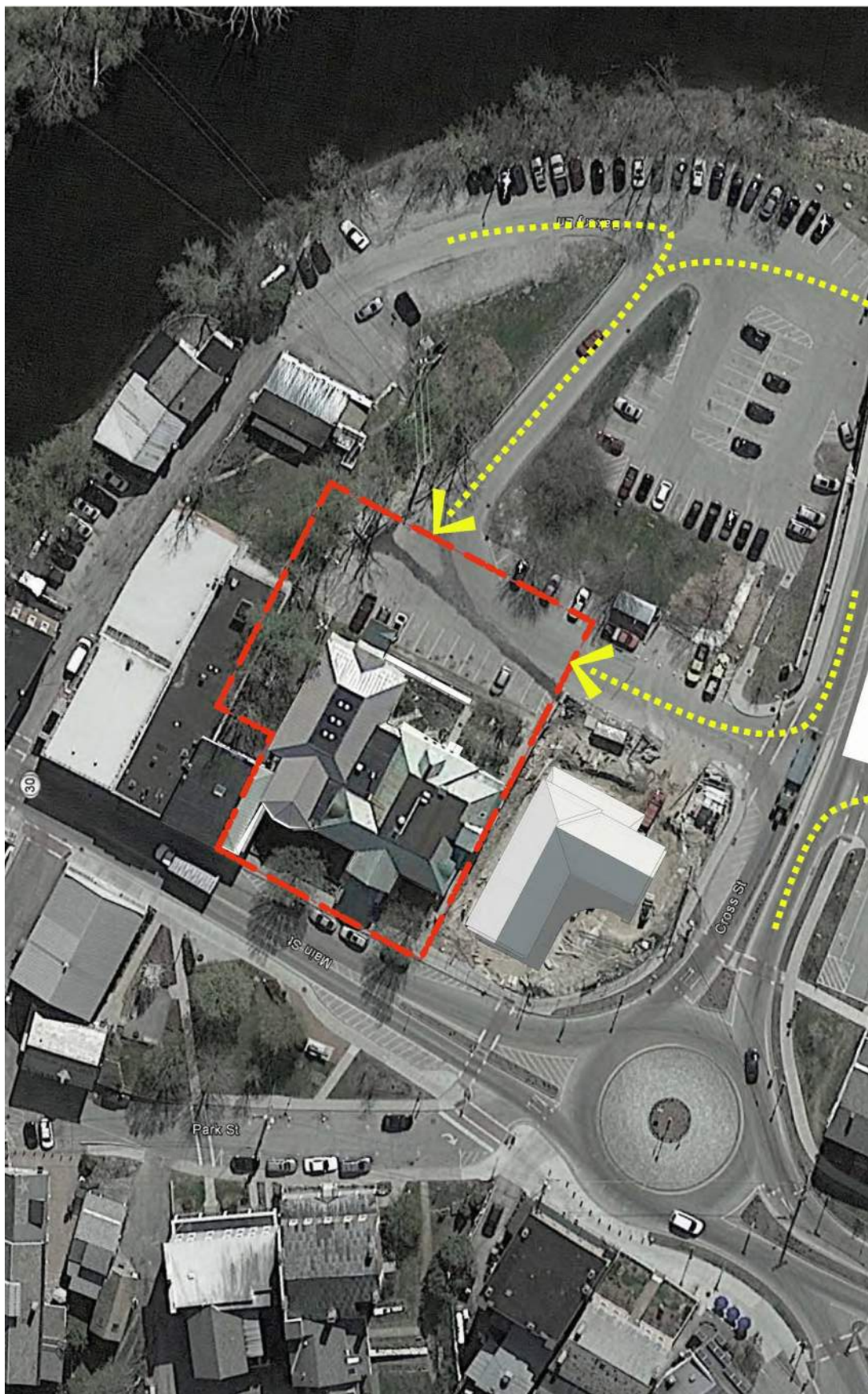
- a. Any renovations or additions that may be proposed will likely require lighting, general power, telecom work, fire alarm devices and potentially mechanical equipment power connections. Any renovation or addition work that might be proposed is not estimated as we do not know the extent of any renovation or addition work at this time.

8. SITE ANALYSIS

8.1 Pedestrian Access



8.2 Car Access

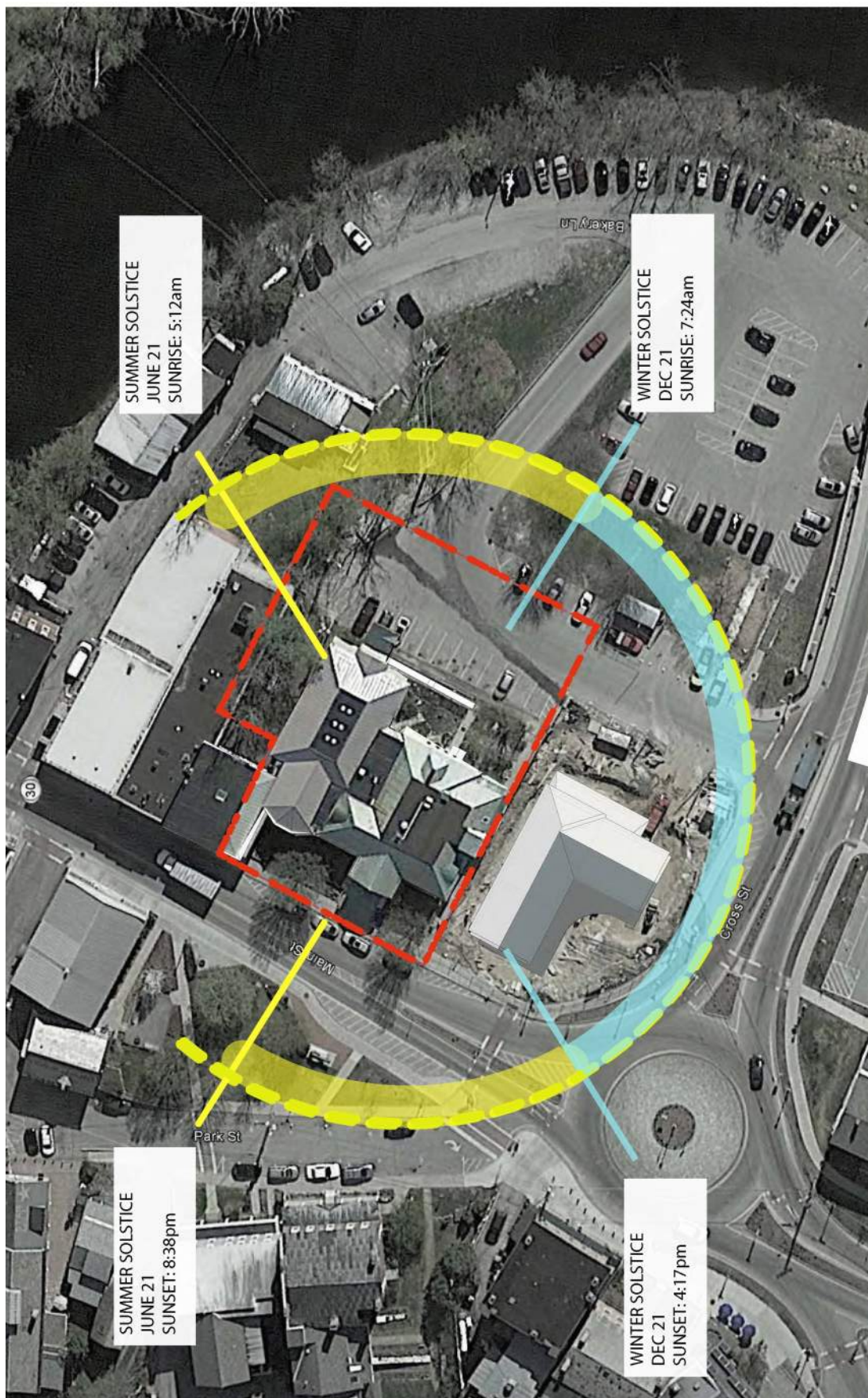


CAR ACCESS

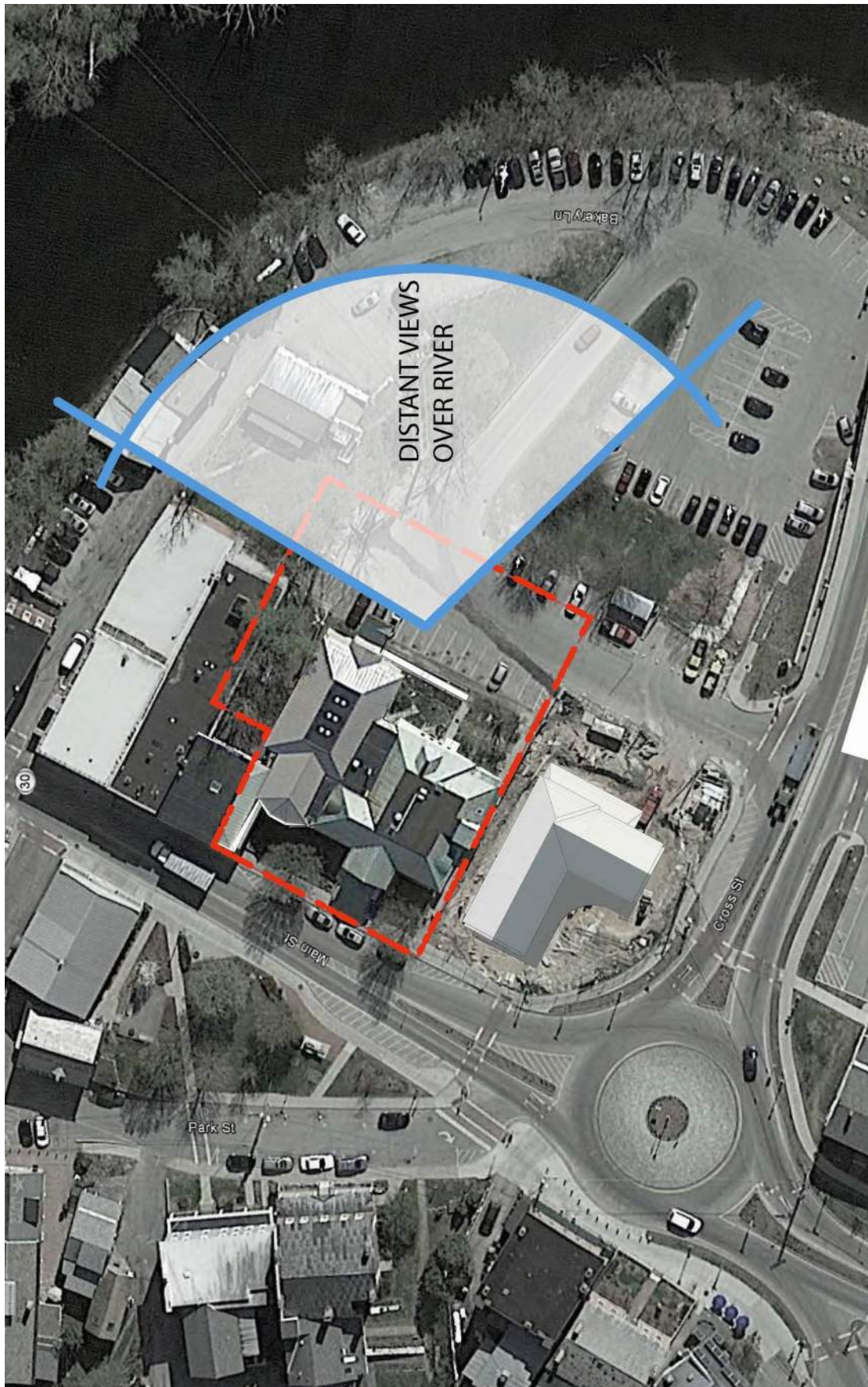
ILSLEY PUBLIC LIBRARY
75 FAIR STREET
MIDDLEBURY, VT 05753



8.3 Solar Access



8.4 Views



6.2 Graphic Program

The graphic program is a graphic representation to scale of existing Ilsley Spaces as compared to programmed spaces.

7.



ILSLEY PUBLIC LIBRARY
 70 WILSON STREET
 HILLSDALE, NY 10801

gbA
 ARCHITECTURE & PLANNING

BAR
 SCALE: 1" = 20'-0"

9.2 Link



- 1 CONNECTION TO EXISTING BUILDING
 - 2 2 STORY ADDITION @ 1,650 SF/FLOOR
 - 3 SKYLIGHTS AT EXISTING BUILDING'S EDGE
 - 4 RAMPED FLOOR TO TRANSITION TO EXISTING LEVELS
 - 5 SPLIT LEVEL ENTRY
 - 6 ENTRY PLAZA
 - 7 RECREATE GARDEN
 - 8 REMOVE 1970'S ADDITION
- 8,400 SF ADDITION AFTER REMOVAL OF 1970'S ADDITIONS**

ILSLEY PUBLIC LIBRARY



75 MAIN STREET
MIDDLEBURY, VT 05753

LINK
SCALE: 1" = 20'-0"

9.3 Adjacent and Restoration



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MIDDLEBURY, VT 05753

ADJACENT & RESTORATION

9.4 Umbilical and Restoration



ILSLEY PUBLIC LIBRARY
 ARCHITECTURE & PLANNING
 25 MAIN STREET
 ANDOVER, VT 05253

UMBILICAL & RESTORATION
 SCALE: 1" = 20'-0"

10. CHOSEN DESIGN DIRECTION

10.1 Site Plan (Not to scale)



SITE PLAN

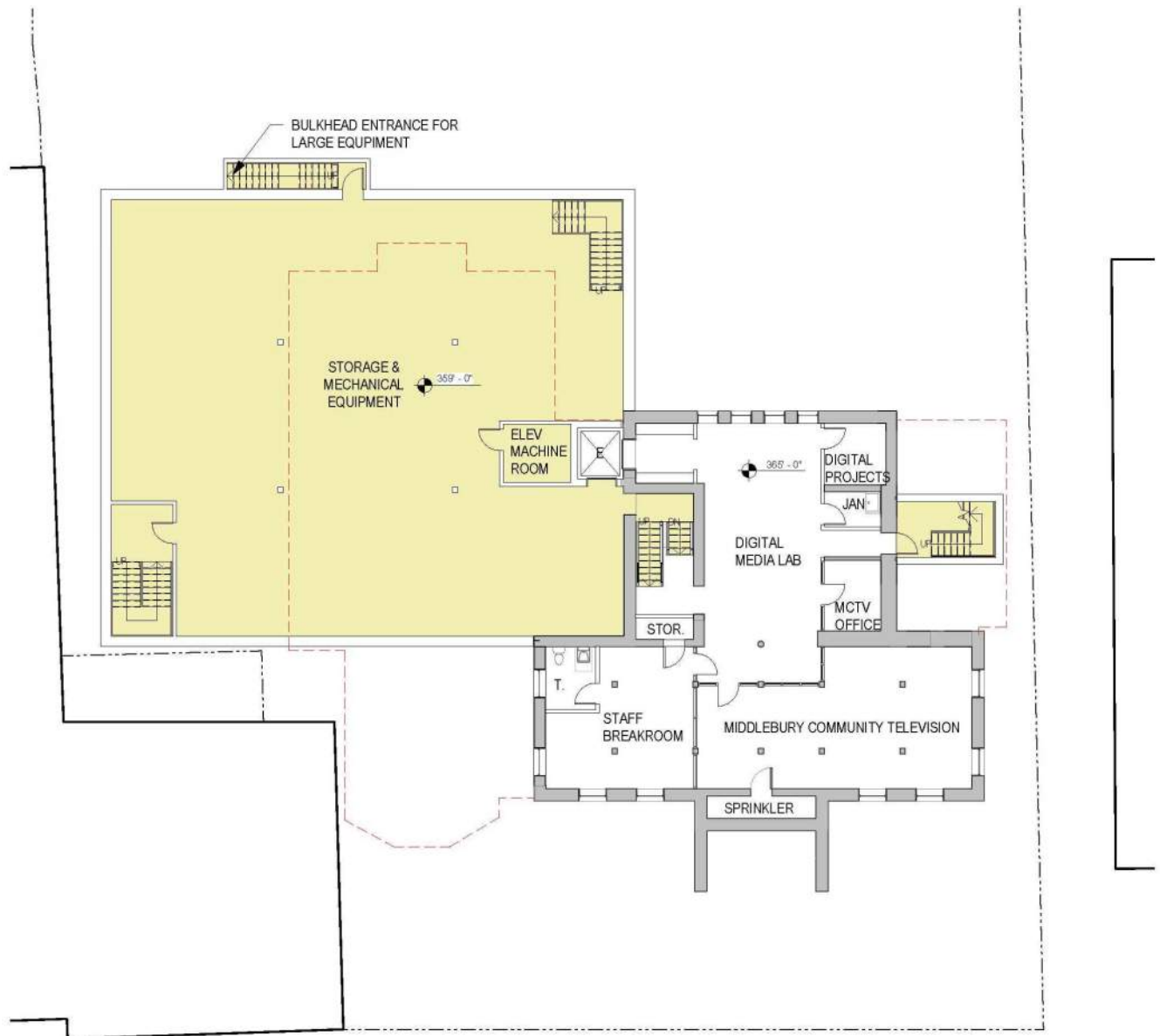
ILSLEY PUBLIC LIBRARY

75 MAIN STREET
MIDDLEBURY, VT 05753

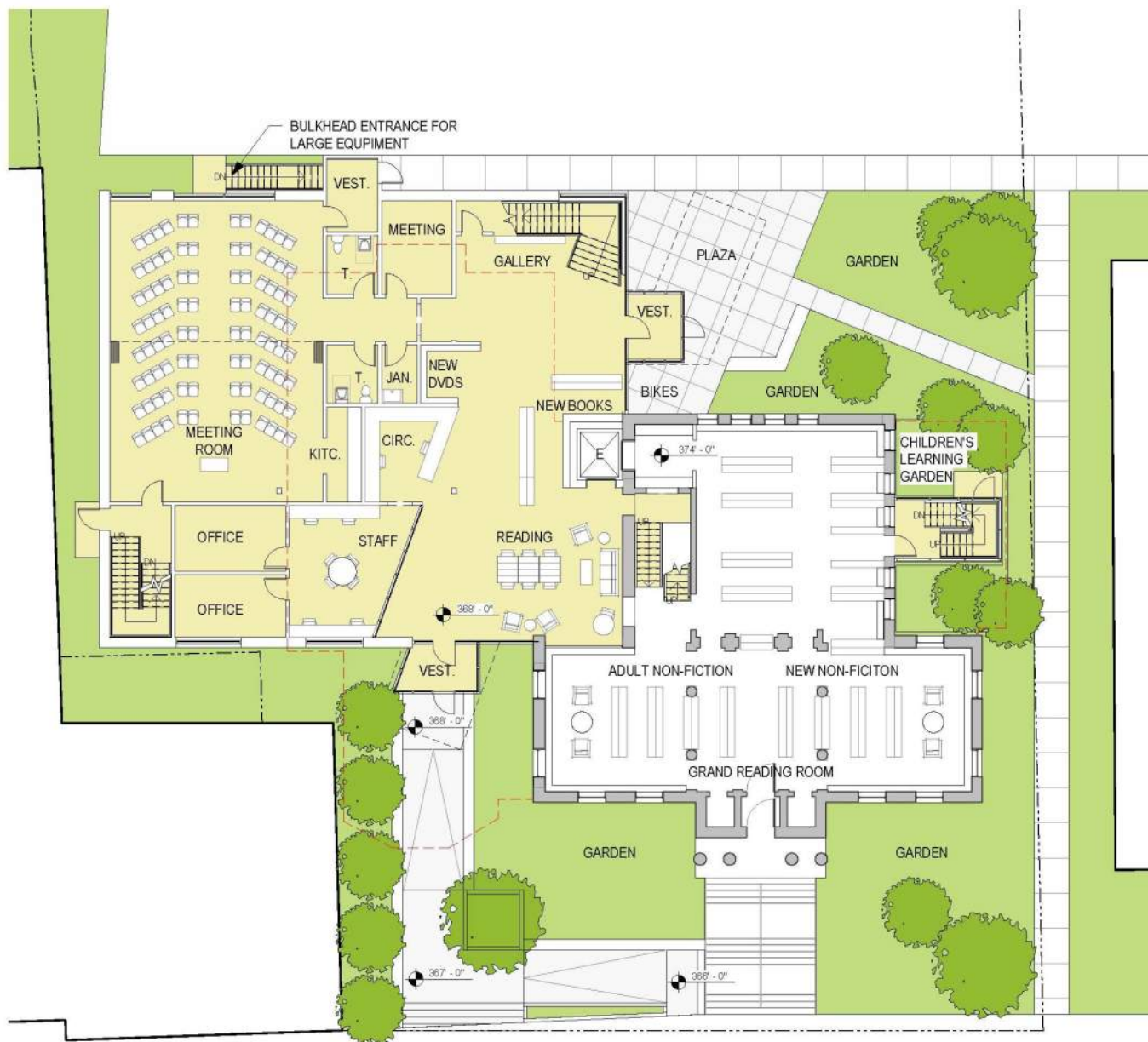


10.2 Floor Plans (Not to Scale)

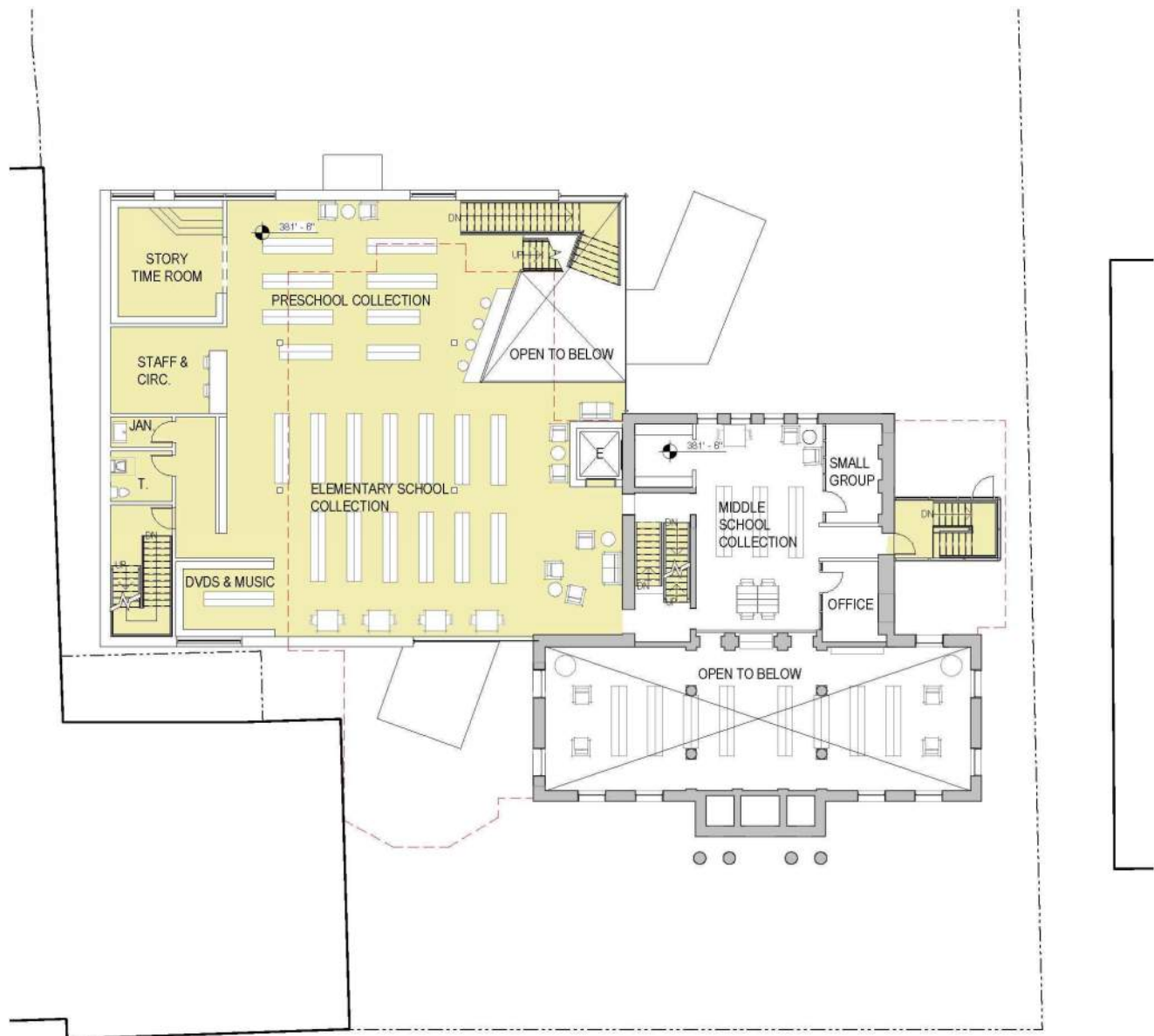
Ground Floor Plan



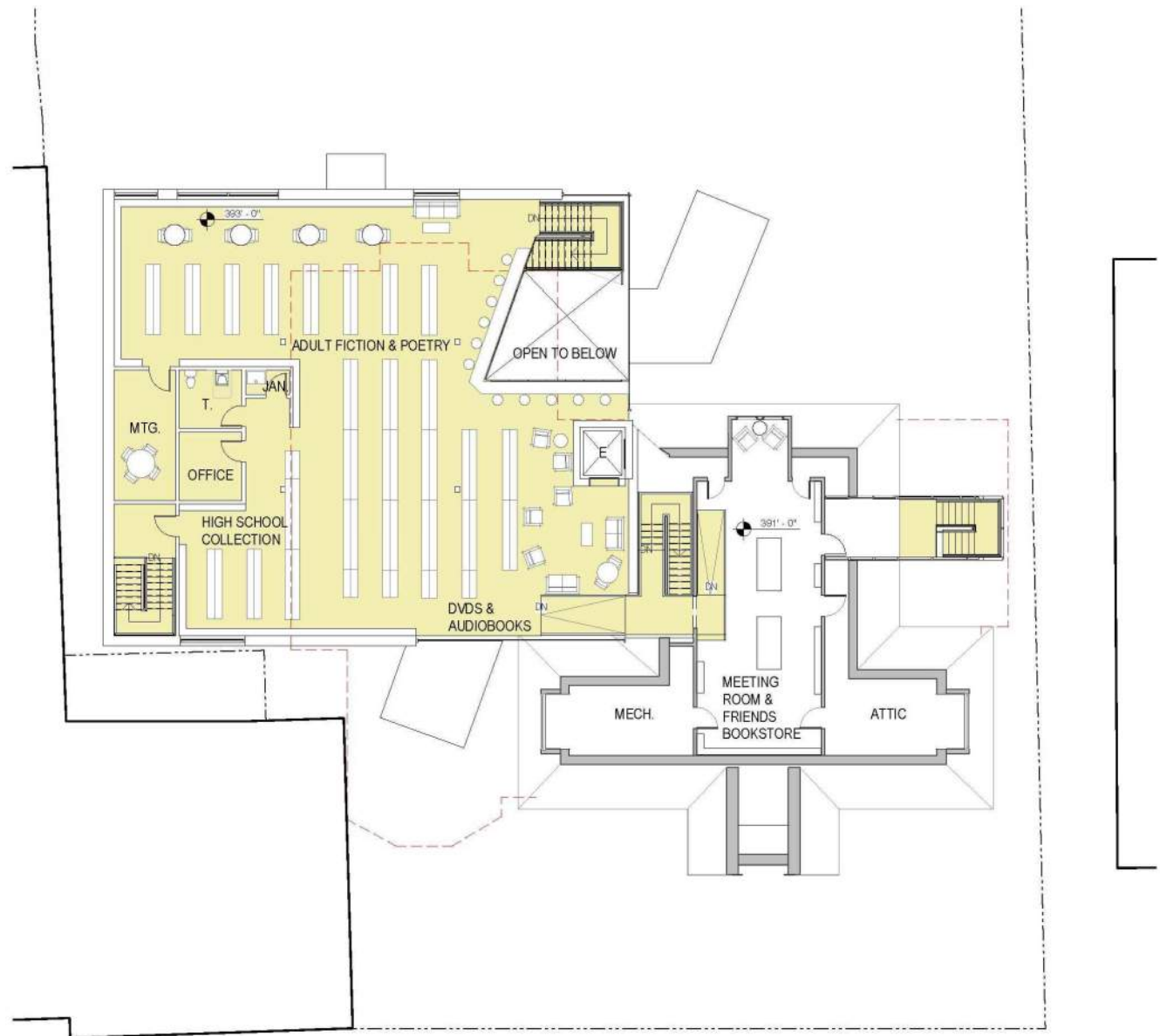
First Floor Plan



Second Floor Plan



Third Floor Plan



10.3 Exterior Views

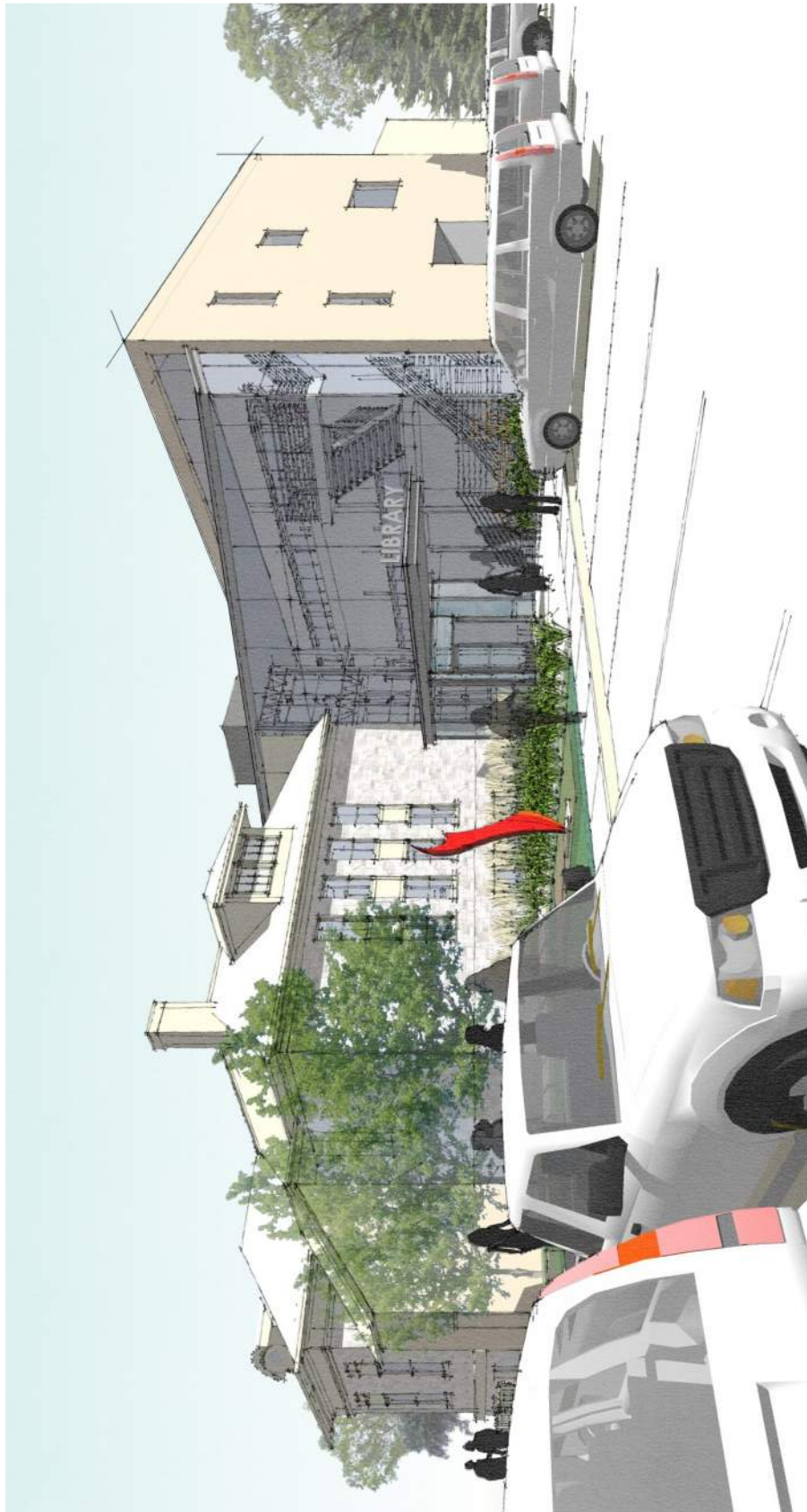
Aerial View



From Main Street



From Parking



11. PRELIMINARY OPINION OF COSTS

Ilsley Public Library - Option #1

14/4/2017

PRELIMINARY CONSTRUCTION COST

Abatement of any hazardous materials		Unknown
Demolition and disposal of 1956SF 1970's addition (4 levels)		\$58,680
Demolition and disposal of 8588SF 1980's addition (3 levels)		\$257,640
Renovation Existing Ground Level	2784SF @ \$160	\$445,440
Renovation Existing Level 1	2784SF @ \$140	\$389,760
Renovation of Existing Level 2	1248SF @ \$140	\$174,720
Renovation of Existing Level 3	1576SF @ \$110	\$173,360
Excavation, waterproofing existing, tie-in perimeter drainage	Assume	\$45,000
New construction basement - unfinished space	4940SF @ \$110	\$543,400
New construction Levels 1, 2 & 3	13,500SF @ \$385	\$5,197,500
Plaza including two entries	Assume	\$250,000
Landscaping	Assume	\$30,000
15% owners contingency (design decisions and construction)		\$1,134,825
PRELIMINARY TOTAL CONSTRUCTION COST	Subtotal	\$8,700,325

SOFT COSTS

Design fees inc. Civil, Arch, Landscape Arch, Structural, Mech, Elect, Fire Prot.		\$652,500
Printing and misc reimbursables		\$15,000
Historic Preservation Consultant	Assume	\$5,000
Fundraising related	Assume	Unknown
Fire prevention permit (\$8,700,325x.008)		\$69,600
Town permits		\$3,400
Stormwater, wastewater, water permits	Assume	Unknown
Legal and financing (cost from owners - assume)	Assume	Unknown
Builders risk (cost from owner's insurance carrier - assumed @ .075%)	Assume	\$65,250
Clerk of works (optional but recommended, assume for part time clerk)		\$90,000

TOTAL PROJECT COST		\$9,601,075
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EXCLUDES

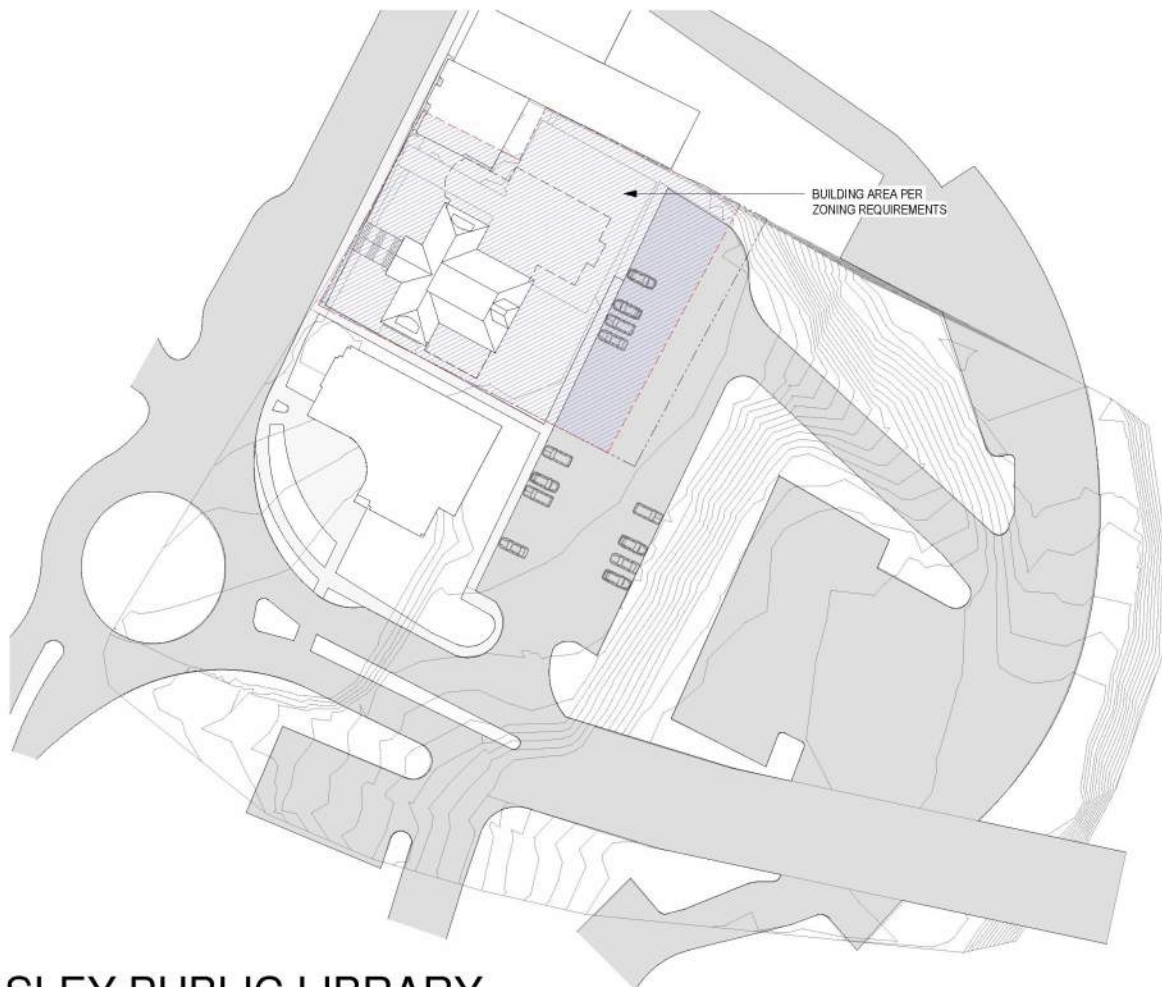
- Solar panels and LEED services if desired
- Moving Expenses and temporary storage
- Rent during construction
- Security Systems
- FFE
- Upgraded water system for sprinklers if needed.



12. TOWN OF MIDDLEBURY ZONING REGULATIONS

Ilsley Public library is located in the CB district and has the following restrictions:

Criteria	Required/Allowed	Existing
Minimum lot size:	10,000 SF	+/- 22,000 SF
Maximum Building Coverage:	NR	NR
Minimum lot frontage:	55 feet	+/- 110 feet
Minimum front yard setback:	0 feet	+/- 23 feet
Minimum side yard setback:	0 feet	+/- 10 feet
Minimum rear yard setback:	15 feet	+/- 50 feet
Maximum height:	50 feet	+/- 39 feet



13. PRELIMINARY BUILDING CODE REVIEW

This preliminary code review of the existing and proposed renovations and additions to the Ilesley Public Library is based on the following applicable codes:

- 2015 International Building Code (IBC) with State of Vermont Amendments.
- 2015 NFPA 101 Life Safety Code with State of Vermont Amendments.
- 2015 Commercial Building Energy Code (2015 CBES; Energy Code)
- 2009 International Mechanical Code.
- 2015 International Plumbing Code with State of Vermont Amendments.
- NFPA 70-2014, National Electric Code with State of Vermont Amendments.
- Vermont Access Rules (ADA), 2012 Edition

PROJECT DESCRIPTION:

Removal of two previous additions totaling approximately 10,500SF

Renovation of original 1928 structure totaling approximately 8,400SF

New construction of approximately 19,700SF addition to existing (excludes basement space)

PROPOSED HEIGHT & AREA AND OCCUPANCY (NFPA Table 7.3.1.2)

Space	Area	Occupancy	
Basement	5300 SF	18	(300 SF/person)
Ground Floor	2780 SF	28	(100 SF/person)
First Floor Reading	5430 SF	107	(50 SF/person)
First Floor Assembly	1100 SF	158	(7 SF/person)
First Floor Business	2650 SF	27	(100 SF/person)
Second Floor Stacks	3300 SF	33	(100 SF/person)
Second Floor Reading	1100 SF	22	(50 SF/person)
Third Floor Stacks	3300 SF	33	(100 SF/person)
Third Floor Reading	1100 SF	22	(50 SF/person)
Third Floor Business	1576 SF	16	(100 SF/person)
	27,637 SF		464 Occupant Total

AFTER ADDITION: (BASED ON 3-16-17 OPTION 1)

Ground Level: 8100SF (includes full basement under entire addition)

First Floor: 8300SF

Second Floor: 5700SF

Third Floor: 6000SF

Sprinkler System: The existing building is equipped with an approved automatic fire suppression system (sprinkler) that will be expanded to provide coverage for additional space (NFPA 13 system).

Construction Type: 5A Unprotected (IBC Table 601) for existing building and proposed addition.

Occupancy Classification: Assembly Group A-3.

Occupant Load: Calculated at 300 SEE TABLE 1004.1.2

Height Limits: 3 stories or 70 vertical feet above grade plane allowed with an approved automatic sprinkler system.

Area Limitations: 34,500SF allowed with an approved automatic sprinkler system.

Mezzanines: (502.2, 505)

Definition: An intermediate level or levels between the floor and ceiling of any story. Mezzanine is considered a portion of the story in which it is contained. Mezzanines shall not contribute to building area or number of stories. The clear height above and below the mezzanine shall not be less than 7 ft. Railing at edge of mezzanine shall be no less than 42" high.

Fire Resistance Ratings – Building Elements (Hours):

<u>IBC 2015</u>	<u>Type 5A</u>
Structural Frame	1 hour
Bearing Walls Exterior	1 hour
Bearing Walls Interior	1 hour
Non-Bearing Walls/Partitions	0 hour
Floor Construction	1 hour
Roof Construction	1 hour.

Means of Egress— IBC 2015 Chapter 10

Exits: Required: two
 Provided: two

Components:

Doors: Required: Minimum 32" clear (1008.1.1) or .2" x max. occupant load (1005.1)
 Provided: 36" provided at all new doors

Stairs: Required: .3 x max. occupant load (1005.1) and not less than 44" (1009) with minimum 4" riser height

14. ANTICIPATED PERMITS/REVIEWS

In order for IPL to undertake additions and renovations, the Owner will need to obtain at least the following permits and/or reviews:

- Advisory Council on Historic Preservation Review.
- Middlebury Conditional Use Hearing.
- Middlebury Zoning Permit.
- Middlebury Sewer Permit.
- Planning approval.
- Building permit from State of Vermont, Division of Fire Safety.

15. POSSIBLE NEXT STEPS

- Community Input Forum #2
- Architect and committee develop marketing materials (brochures, posters, etc.).
- Committee work with fundraiser.
- Partial funding secured by combination of grants, donations and foundations.
- Partial funding secured by Town bond vote.
- IPL Trustees determine make-up of building committee.
- Contract with Architect and their consultants to prepare construction documents.
- Schematic design (assume 4 months).
- Design development (assume 3 months).
- Preparation of construction drawings and specifications (assume 6 months).
- Determine pre-selected list of General Contractors to be invited to submit bids.
- Abatement of known hazardous materials.
- Bid the project (assume 1 month).
- Relocate all contents from both removed additions.
- Demolish 1977 & 1988 additions.
- Construction begins.
- 14-16 months later—move in.