

ANALYSIS REPORT



BIG BEAR LAKE PROPERTY RENOVATION PROJECT



INSTITUTIONAL DESIGNS AND ARCHITECTURAL SERVICES

3903 10TH STREET, RIVERSIDE, CA 92501
T: 951.342.3135 F: 951.342.3137

PREPARED BY

ARCHITECTURAL

SHAWN CHINUDOMSUB,
Principal Architect
ANH NGUYEN,
Project Designer
Institutional Designs
and Architectural Services
3903 10th Street
Riverside, CA 92503

STRUCTURAL

MICHAEL S. RILEY,
Structural Engineer
ABS Consulting
300 Commerce, Suite 200
Irvine, CA 92602

MECHANICAL/PLUMBING

IVAN RAY CRANSTON, Principal
Mechanical Engineer
F.T. Andrews
831 South Harbor Boulevard
Anaheim, CA 92805

ELECTRICAL

JEFFREY S. HANKIN, Principal
Electrical Engineer
KELLY J. MAMER, Associate,
Project Manager
RAEJEAN F. LAUGHTER,
Project Designer
Sparling
5355 Mira Sorrento Place
San Diego, CA 92121



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EXECUTIVE SUMMARY

INTRODUCTION

In August 2008, Institutional Designs and Architectural Services (IDAS) conducted an architectural and engineering evaluation of the Big Bear Lake Property, a two-story wood-framed building, owned by the University of California, Riverside. The purpose was to prepare an analysis for the conversion of the property from an existing single-family residence to a lodging/recreation facility. The analysis would identify areas which are not in compliance with the California Fire Building Code, Life Safety and ADA accessibility requirements, and provide recommendations for updating the building to meet other applicable code requirements as necessary for the proposed conversion.

The scope of this report includes a field survey and assessment of existing building conditions and its mechanical, plumbing, electrical, structural systems, Fire Life Safety and ADA accessibility in written documents and drawings. The report also contains Conceptual Plans showing the tentative improvements and Preliminary Construction Cost Estimates.

This report does not put emphasis on the larger trend toward sustainable design, which heavily favors reuse of existing buildings to minimize environmental impact and to consume less energy. When the organization makes a commitment to reduce use of nonrenewable resources, a separate study on sustainable design for this project is recommended.

ARCHITECTURAL EVALUATION AND RECOMMENDATIONS

Under the 2007 California Building Code and the County of San Bernardino Fire Safety Overlay District Construction Requirements, the building, due to its age and a less stringent set of regulations from the past, lacks many provisions of fire life safety features that are required for the proposed conversion. For example, according to the means of egress requirements, an additional exit is required on the second floor. The doors to each bedroom on the second floor must be widened to accommodate the exiting requirements. Automatic fire sprinkler and alarm systems need to be provided. All exterior siding, windows and doors are required to be replaced with fire-rated construction materials.

In regard to accessibility, the findings and recommendations call for relocation of rooms and reconfiguration of the floor plan. The removal of the architectural barriers to meet ADA accessibility requirements is achievable with moderate space rearrangement. Demolition of the entire building is unnecessary.

The first floor is suggested to be made fully accessible by remodeling several rooms, totaling roughly one-third of the overall floor area, and by providing proper signage. The proposed improvements include the addition of an accessible parking space, an entrance ramp, an accessible path to the primary entrance, and an accessible bedroom and bathroom. Also required are the modification of doors, kitchen counters and related plumbing fixtures.

The second floor is recommended to remain inaccessible to wheelchair users. To make the second floor fully accessible would cause unreasonable hardship. Therefore, only minimal improvements on the second floor are proposed, not for accessibility deficiencies, but primarily to correct Fire Life Safety features.

STRUCTURAL EVALUATION AND RECOMMENDATIONS

The existing wood-framed building, constructed in several phases, is required to be seismically upgraded. New shear walls must be added to augment the existing structure. To facilitate shear transfer, the existing wood siding at the exterior walls and gypsum board at portions of the interior walls should be removed for the installation of plywood sheathing with hold-down anchorage. The bottom wood sills require additional nailing, the new sill plates require straps and anchorage, coil straps are to be nailed to the sides of the top plates, and roof rafter blocking should be strapped to the wall top plates.

In addition to new shear wall construction, limited destructive investigation is recommended for further detailed analysis and clarification prior to remodeling work. The ceiling finishes should be removed at three locations on the interior to verify existing second floor framing construction.

The survey will also help determine if and where additional header beams are needed in the remodel.

MECHANICAL EVALUATION AND RECOMMENDATIONS

The proposed occupancy type and increased load will tax the existing mechanical system which was marginally designed to accommodate a single-family residence. The existing water heaters, providing both domestic hot water and space heating, are not capable of heating both the water and the building at the same time. Two wood burning fireplaces and a portable electric heater supplement the HVAC system.

The space heating capacity can be increased in either two ways. The water heaters can be replaced with new, larger units to meet increased space heating requirements. While hot water is provided, the building can also be heated. The other option is to separate the space heating from the water heating system and replacing the fan-coil units with gas-fired furnaces.

PLUMBING EVALUATION AND RECOMMENDATIONS

The plumbing system requires several upgrades. The increased water demand, to meet the higher occupancy load and the addition of fire sprinklers, requires a size and capacity increase in the domestic water system. The piping for the cold water, hot water and natural gas, though in satisfactory condition, need to be increased in size. A new water meter is needed. In addition, the hot water piping is required to be insulated. The entire building will be provided with a fire sprinkler system and the piping needs to be insulated against freezing. The landscape irrigation system requires a backflow protection device.

Plumbing fixtures throughout the building are not ADA compliant and should be replaced in the bathrooms and kitchen within the remodeled area. The domestic water heaters should be replaced with either three heavy-duty, tankless gas water heaters or one high efficiency water heater tank. The water heaters should be installed in a pan.



ELECTRICAL EVALUATION AND RECOMMENDATIONS

In areas that are being proposed for remodeling, light switches and receptacles will need to be modified for egress and accessibility. To meet minimum lighting requirements, new lighting is to be added to the relocated and added rooms. A centralized fire alarm system, on battery backup, is needed. New smoke detectors will be installed in the hallways, bedrooms and living areas, and visual notification in the first floor bedrooms, living spaces and exit pathways. Exit signs, egress and additional lighting are also required in the hallways, exit paths, and at building exits. The second floor deck requires emergency lighting.

Unless the design program is significantly changed, the 200A main panel is sufficient for the building load. However, the current main panel lacks spare circuit space. A subpanel may need to be added to increase capacity for additional circuits.

CONCEPTUAL SCHEMES

IDAS proposes a conceptual scheme with a number of design improvements on the interior and extensive hardscape work on the exterior to illustrate the magnitude and the scale of the proposed conversion. The kitchen opens up to the living room. An accessible bedroom and a bathroom are added. The laundry room, the HVAC room and a bedroom's entrance are relocated to create accessibility to the common public spaces. On the exterior, the entrance stairs are widened and accessible parking and an entrance ramp are added to make the front entrance accessible. Overall, the design recommendations are based on code, fire life safety and accessibility requirements while also incorporating amenities, improving the overall operation of the building.

This report does not contain final design solutions to the problems discovered during the investigation. Suggestions made in this report are intended only as an illustrated example for future design and engineering work.

PRELIMINARY CONSTRUCTION COST ESTIMATES

On page 76, the architecture and engineering total estimated costs for the remodel are for program planning purposes, to be interpreted as approximate costs. For comparison, the cost for a new building the same size as the existing building is provided. Final remodel costs are subject to the University of California, Riverside's decision and judgment on future design solutions.



OBJECTIVE OF THE STUDY

Institutional Designs and Architectural Services (IDAS) and its consultants were retained by the University of California, Riverside to conduct architectural and engineering (structural, mechanical, plumbing and electrical) evaluation of the Big Bear Lake Property. The existing building is to be converted from a single-family residence to a lodging/recreation facility for members of the Recreation Department to use for educational and instructional programs. The evaluation would assess whether the existing building complies with the current building code, fire life safety, and ADA accessibility requirements.

SCOPE OF THE STUDY

The scope is as follows:

- **Documentation of the existing building:** Visually inspect the existing building to establish original materials and methods of construction. Identify modifications, additions, and repairs that may have been made to the building. Assess the physical conditions in respect to code compliance.
- **Assessments:** Perform code research and analysis to identify portions of the existing building noncompliant with Fire and Building codes. Assess Life Safety features and identify architectural barriers based on the Americans with Disabilities Act (ADA) and California Building Code (CBC).
- **Conceptual schemes:** After studying the patterns of existing flow, space utilization and circulation, establish necessary measures to eliminate causes of code noncompliance. Locate recommendations, such as the accessible bedroom and bathroom, on the plans and site plans.
- **Preliminary construction cost estimates:** Provide rough order of magnitude costs for the proposed schemes.

BUILDING HISTORY AND PHYSICAL CONDITION

The Big Bear Lake Property is situated on an approximately 1.5 acre site, at the intersection of Glenview Road and Edgemoor Road in the City of Big Bear Lake. The front side of the lot on Edgemoor Road is approximately 180 feet, and the depth of the lot running along Glenville Road is roughly 208 feet. The present 2-story single-family residential building is located on the southwest side of this parcel near the street intersection. The one-story barn behind the building appears to have been abandoned for a long period to time. From the street corner, the asphalt driveway runs diagonally to the front porch of the main house and then curves back around to Edgemont Road. The existing 5-space parking lot is positioned on the south portion of the lot along Glenview Road. Absence of a curb and gutter makes it difficult to distinguish the asphalt from the natural dirt ground, typical of the landscape in the neighborhood.

The wood frame house and the barn have wood-stained vertical siding, most likely redwood plywood. The siding of the house changes, for an unknown reason, to horizontal clapboard at the upper level. Parallel to Edgemoor Road, the ridge of the fiberglass shingle gable roof runs along the length of the house, with several intersecting cross gables that form the front façade. Viewing the side of the house, the main gable has unequal pitches. The slope flattens out towards the front of the house, the Edgemoor Road side. The steeper rear side of the gable slopes down and ends at the second floor level, becoming a slanting wall.

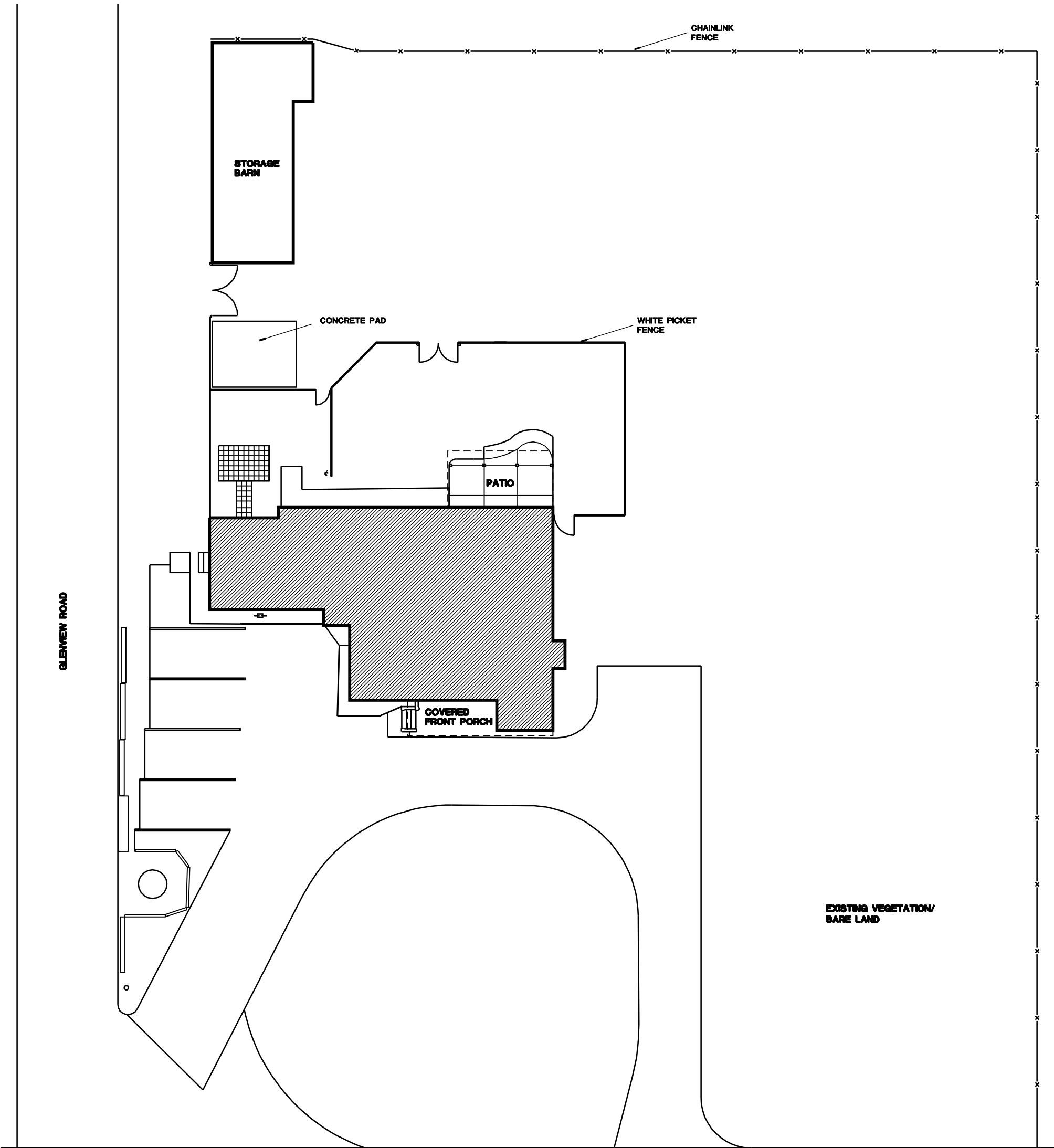
A painted wood stair runs from the edge of the driveway up the side of the front porch. The porch is raised approximately three and a half feet off the ground. A row of wood posts supports the porch floor and continues up to a beam supporting the lean-to roof that covers the entire porch area, with its higher edge attached to the second floor exterior wall. The porch and the roof cover are built in light wood frame construction.

The building was constructed in several phases. The main building running north-south, the original structure, was built in 1947. Built later was a small south addition. The current total size of the building area is 3,604 square feet.

The observations during the field surveys indicate that the Big Bear Lake property, except for the barn which is outside the scope of this report, is in relatively good condition, with no visual evidence of damaged or seriously deteriorated structural or nonstructural elements to adversely affect the proposed conversion. There is some minor dry rot on the exterior wood siding and trim. The typical deterioration of the existing interior finishes and woodwork can easily be repaired or replaced. The building is suitable for immediate occupancy as a single-family residence.

Immediately following this section are drawings showing current conditions of the building as found and field measured by the investigating team: the site plan, first and second floor plans and exterior elevations. On the site plan, the property lines are not shown and the configuration of the front and side streets and perimeter fences are approximate due to the lack of property markers and an accurate engineering survey. The site plan should not be used for any engineering or construction work other than for rough graphical illustrated purposes.





GLENVIEW ROAD

CHAINLINK FENCE

STORAGE BARN

CONCRETE PAD

WHITE PICKET FENCE

PATIO

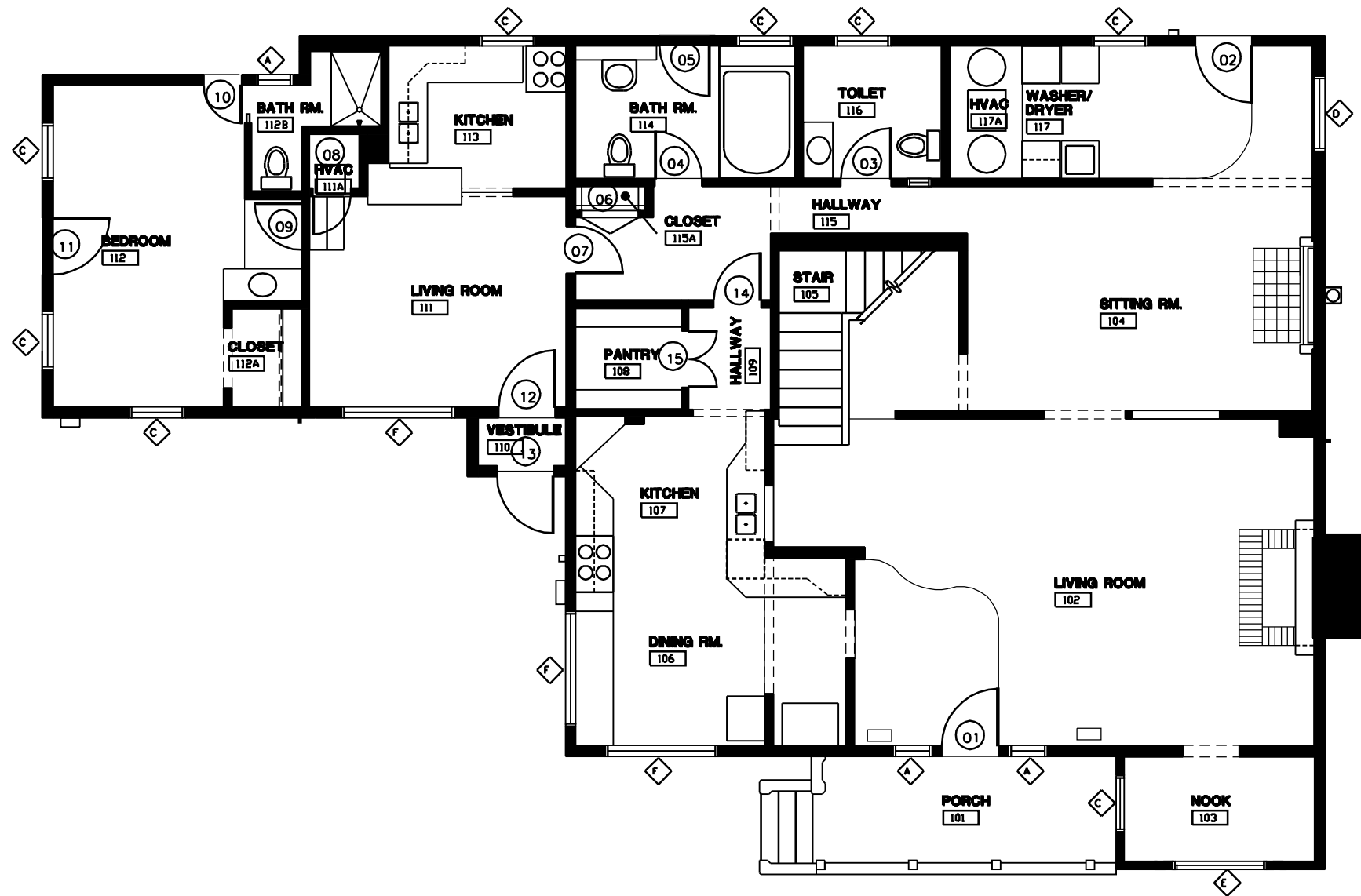
COVERED FRONT PORCH

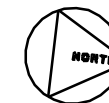
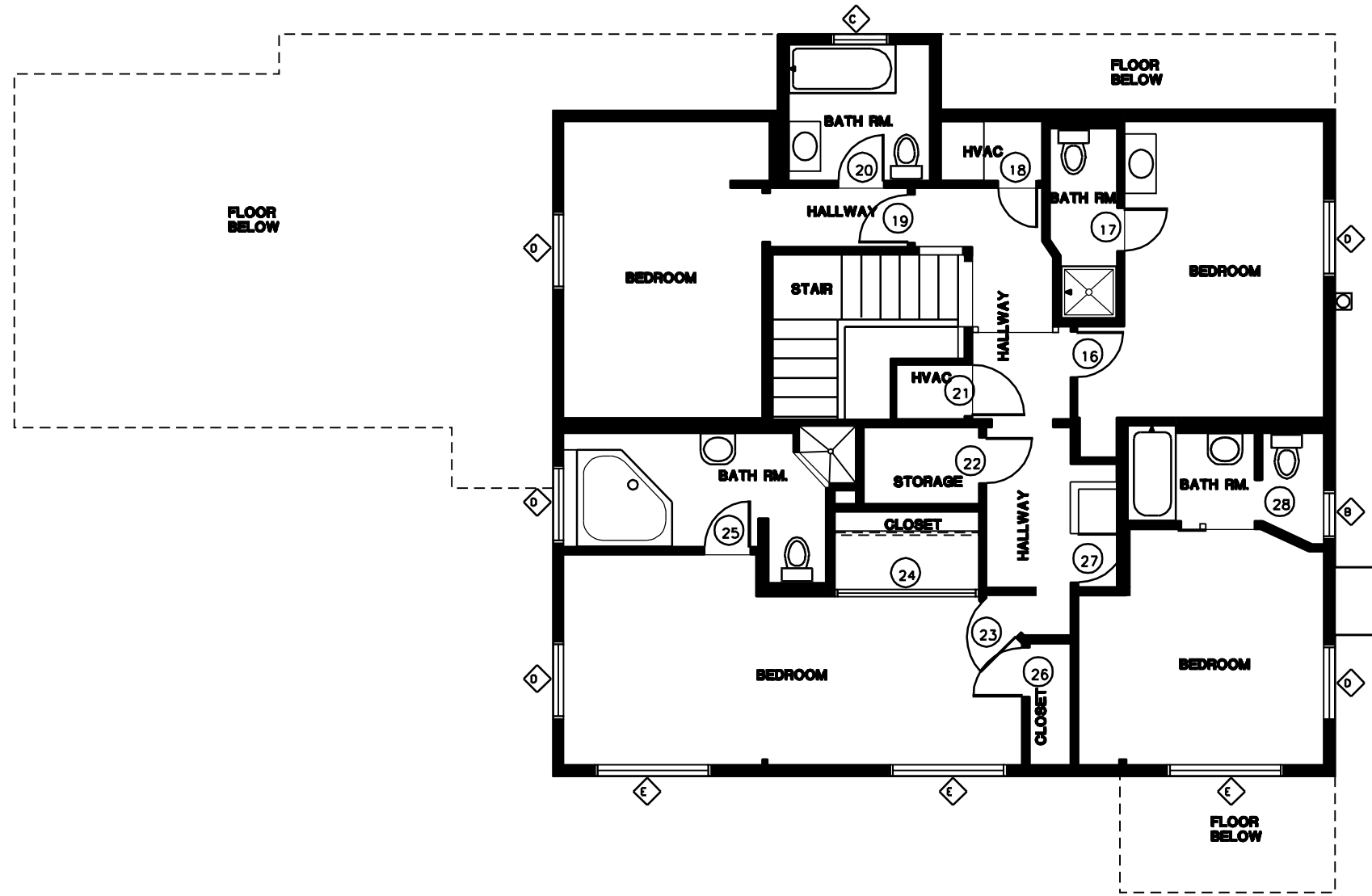
EXISTING VEGETATION/
BARE LAND

EDGEMOOR ROAD



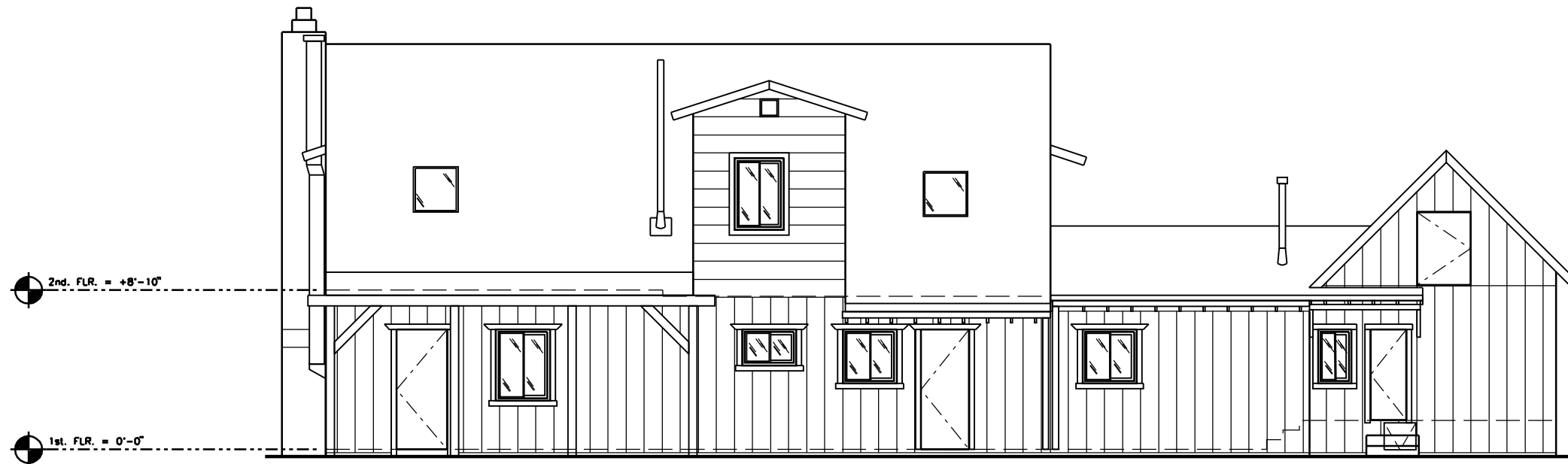
UC RIVERSIDE BIG BEAR LAKE
PROPERTY RENOVATION PROJECT
EXISTING CONDITIONS
SITE PLAN
1/20"=1'-0"



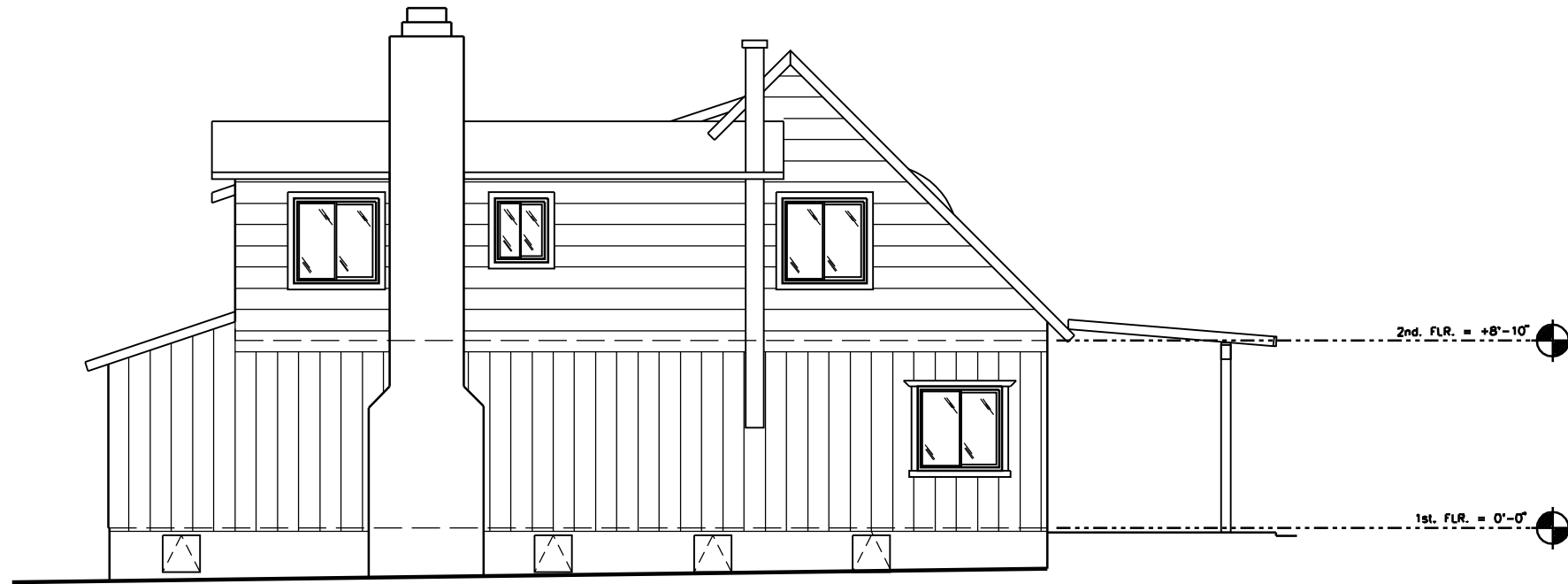




EAST ELEVATION



WEST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION

FIRE LIFE SAFETY CODE ASSESSMENT

GENERAL

This section of the assessment is to determine the compliance of the building with the fire life safety provisions of the building codes. The assessment represents only an abbreviated format and should not be construed as a comprehensive listing of all code requirements. The primary intent is to include only the items considered to be essential to the preservation of the life and well being of the building occupants.

APPLICABLE CODES AND STANDARDS

The following are the current enforceable codes and design standards for facilities at the time of this assessment and investigation:

2007 California Building Standards Administrative Code

Part 1, Title 24, California Code of Regulations (CCR)

2007 California Building Code

Part 2, Title 24, CCR (2006 IBC and 2007 California Amendments)

2007 California Electrical Code

Part 3, Title 24, CCR (2005 NEC and 2007 California Amendments)

2007 California Mechanical Code

Part 4, Title 24, CCR (2006 UMC and 2007 California Amendments)

2007 California Plumbing Code

Part 5, Title 24, CCR (2006 UPC and 2007 California Amendments)

2007 California Fire Code

Part 9, Title 24, CCR (2006 IFC and 2007 California Amendments)

County of San Bernardino Fire Safety Overlay District Construction Requirements



BASIC BUILDING INFORMATION

The intent of the building codes is to ensure the public safety, health and welfare. It either dictates how materials are to be employed in a safe manner in a building or sets the minimum performance standard to be met by the design and construction of the building. The code separates types of construction and occupancy into several classifications. A building in each classification must be made to conform to the technical requirements, limitations, and other performance criteria set out in the codes. The following summarizes the basic building information, based on the code requirements for the Big Bear Lake property.

Year Built:	The original portion in 1947, with several later additions
Architects:	Unknown
Builders:	Unknown
Occupancy Type:	<i>Existing:</i> R-3 <i>Proposed:</i> R-1
Allowable Floor Area: (Per Code, based on Construction and Occupancy Type)	7,000 square feet
Current Building Size:	<i>First Floor:</i> 2,176 square feet <i>Second Floor:</i> 1,428 square feet <i>Total:</i> 3,604 square feet
Actual Height:	25 feet from 1st floor level
Allowable Height:	40 feet
Number of Stories:	2
Allowable Stories:	2
Construction Type:	<i>Existing:</i> Type V-N (1997 UBC) without automatic sprinklers <i>Proposed:</i> Type V-B with automatic sprinklers

Fire Resistance-Rated Construction:

Exterior Wall: Any material to be noncombustible or ignition-resistant, heavy lumber, per County of San Bernardino

Exterior Bearing Wall: No Requirements

Interior Bearing Wall: No Requirements

Exterior Nonbearing Wall: No Requirements

Interior Nonbearing Wall: No Requirements

Structural Frame: No Requirements

Floor and Floor-Ceiling: No Requirements

Roof and Roof-Ceiling: No Requirements

Exterior Doors and Windows: No Limit (More than 30 feet) (20 min. fire rating or noncombustible per County of San Bernardino)

Fire Wall: No Requirements

Fire Barrier: No Requirements when furnace room is less than 400,000 BTU per hours and laundry room is less than 100 square feet.

Fire Partition: No Requirements

Smoke Barrier: No Requirements

Smoke Partition: No Requirements

Horizontal Assemblies: No Requirements

Opening Protective: No Requirements

Duct and Air Transfer Openings: No Requirements

Concealed Spaces: Fire Blocking: **Unknown**
Draftstopping: No Requirements

Interior Finish:

(With automatic sprinkler system)

Wall: Room and enclosed spaces: Class C

Floor: Class II (minimum critical Radiant Flux)

Fire Protection System: *Automatic Sprinkler System:* A fire sprinkler system need to be provided and is required to be per NFPA 13R.

Fire Alarm System: A fire alarm system needs to be provided and is required to be an automated system.

DESCRIPTION OF TABLE

Immediately following is the Fire Life Safety Assessment table. The applicable features being investigated are summarized in an order roughly corresponding to the order of appearance in the sections of the County of San Bernardino Fire Safety Overlay District Construction Requirements, and the 2007 California Building Code.

The applicable building features and its components are visually and dimensionally reviewed for fire life safety compliance. Each feature is assigned a number. Only the features that are not compliant are keyed to the first and second floor plans following the table.

Noncompliant features that are self-explanatory, affecting large general areas of the building, or duplicate other code deficiencies are not keyed. The descriptions, the reasons, the recommendations, the referenced code sections, the cost to correct the noncompliance and additional clarifying comments are listed.

No destructive survey or laboratory testing of materials was needed to complete Fire Life Safety analysis.

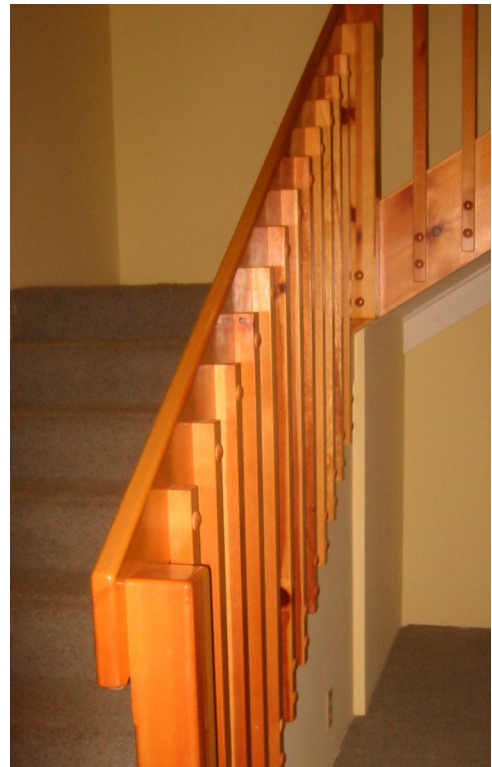


TABLE FIRE LIFE SAFETY ASSESSMENT

ITEM	DESCRIPTION	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					

FIRE RESISTANCE-RATED CONSTRUCTION

1	EXTERIOR WALL							
1A	Siding		X	Combustibility.	Replace.	County of San Bernardino	\$15,000	
1B	Insulation		X	Combustibility.	Replace.	County of San Bernardino	\$3,000	
1C	Exterior Windows		X	Fire Rating or Ignition Resistance.	Replace.	County of San Bernardino	\$37,700	
1D	Exterior Doors		X	Fire Rating or Ignition Resistance.	Replace.	County of San Bernardino	\$7,500	

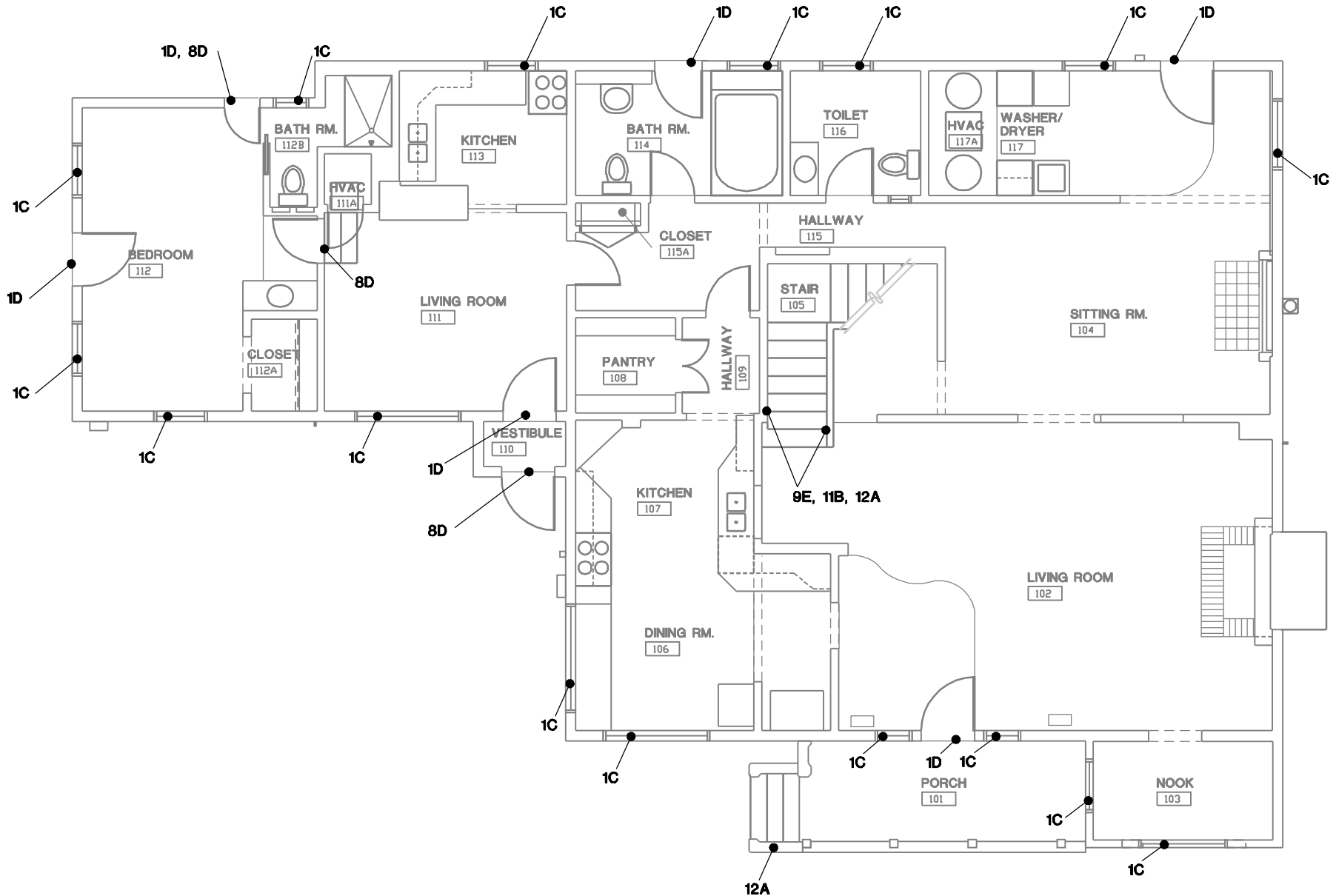
FIRE PROTECTION SYSTEM

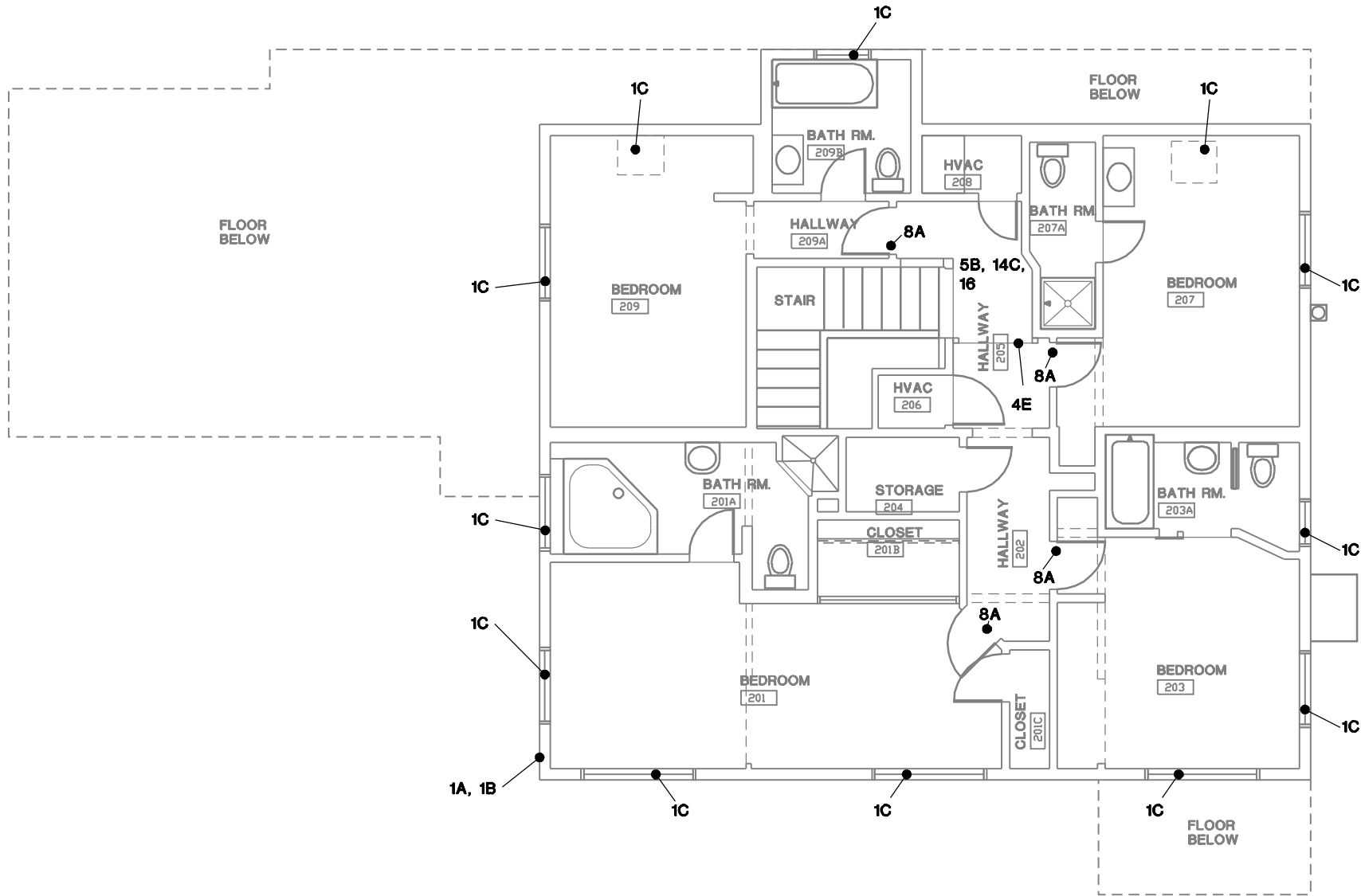
2	AUTOMATIC SPRINKLER SYSTEM		X	Lacking.	Provide new automatic fire sprinkler system.	903.1	--	See Mech. section
3	FIRE ALARM SYSTEM		X	Lacking.	Provide new automatic fire alarm system.	907.1	--	See Mech. section

ITEM	DESCRIPTION	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
MEANS OF EGRESS								
4	GENERAL							
4A	Ceiling Height	X		>7'-6"		1003.2	--	
4B	Protruding Objects	X		>80" high		1003.3	--	Head room clearance.
4C	Horizontal Projections	X		<4" and >80" high		1003.3	--	
4D	Floor Surface	X		Slip-resistant		1003.4	--	
4E	Elevation Change		X		Add nosing and handrails.	1003.5	\$1,000	Modify the step to become stair as defined by code.
4F	Egress Continuity	X				1003.6	--	
5	OCCUPANT LOAD							
5A	First Floor: 11	X				1004.1	--	
5B	Second Floor: 8		X	Actual load is 16 per program	Second exit required.	1004.1	\$34,000	Includes exterior balcony and exterior stair.
6	EGRESS WIDTH							
6A	Minimum Required Egress Width	X				1005.1	--	
7	ACCESSIBLE MEANS OF EGRESS							
7A	Accessible Egress	X				1007.1	--	Code Exemption

ITEM	DESCRIPTION	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
8	DOORS AND GATES							
8A	Side of doors		X	32" clear width minimum.	Replace doors.	1008.1.1	\$6,000	Due to Fire Life Safety or Accessibility deficiencies, four doors are modified and several eliminated on the first floor; two doors are modified, three doors are relocated and one eliminated on the second floor.
8B	Height	X		7'-8" clear height.			--	
8C	Door Swing	X				1008.1.2	--	
8D	Floor elevation		X	Floor or landing does not comply.	Remove opening/modify.	1008.1.4	--	
8E	Hardware		X	Twisting of wrist to operate.	Replace hardware	1008.1.8.1	--	
8F	Gates		X		Eliminate.	1008.2	--	
9	STAIRWAYS							
9A	Width	X				1009.1	--	
9B	Headroom	X				1009.2	--	
9C	Treads & Risers	X				1009.3	--	
9D	Landing	X				1009.4	--	
9E	Handrail on both sides.		X	Handrails only on one side of stair.	Provide handrails on side of stairs.	1009.10	\$3,000	The existing stair lacks a handrail on one side, and the existing handrail on the other side does not comply.
10	RAMP (N/A)							
11	HANDRAILS							
11A	Height	X				1012.2	--	
11B	Graspability		X		Replace handrail.	1012.3	--	See 9E.

ITEM	DESCRIPTION	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
12	GUARDS							
12A	Required		X	Noncompliant guards at stairways.	Replace guards at stairways.	1013.1	--	
13	EXIT SIGN							
13A	Tactile Exit Signs		X	Lacking.	Provide tactile exit signs.	1011.3	\$1,000	
14	EXIT ACCESS DOORWAYS							
14A	Two exits required					1015.1		
14B	First Floor: 1	X					--	
14C	Second Floor: 2		X		Provide additional exit.			See 5B.
15	EXIT TRAVEL DISTANCE							
15A	Limitation	X		<200'		1016.1		
16	MINIMUM NUMBER OF EXIT PER STORY		X	2 per story.		1019.1		See 5B.
17	VERTICAL EXIT ENCLOSURE	X		Enclosure not required.		1020.1		Code Exemption





SUMMARY

The existing building is deficient in fire life safety. These deficiencies must be mitigated during the building's conversion from a single-family residence to a recreation facility. The findings and recommendations can be summarized as follows:

EXTERIOR

In addition to the Fire Life Safety codes, the County of San Bernardino issues a separate set of regulations for the construction of new buildings within Big Bear Lake, a city zoned as a high fire hazard area. The Fire Safety Overlay District Construction Requirements apply to renovations if the remodel is 50% of the existing building or for projects of this scope and size, 50% of the construction costs. Siding and insulation should be replaced with fire-rated materials.

INTERIOR

The building lacks automatic fire sprinkler and fire alarm systems.

1ST FLOOR

The building lacks exit signs. Compliant handrails and guards need to be provided at the stairs.

2ND FLOOR

Code requires the floor to have no elevation change. Hallway 205 has a six-inch floor elevation change. To comply with code requirements, nosing and handrails on both sides can be added to the step, modifying it to become a stair. The doors to the bedrooms do not comply. The four doors have clearance widths less than the required 36 inches. For the increased occupancy load, egress requirements state an exit for the second floor is required.

COST

Mitigating the deficiencies is found to be simple and straightforward. Except in a few instances, most of the cost figures can be itemized line-by-line, corresponding to each deficiency as shown in the table.

The solutions do not require complex reconfiguration of the floor layout or relocation of functions. However, there are many deficiencies that either duplicate other code violations or would be negated by the result of other code corrections. Those cost items, therefore, are left blank.

The cost figures used in this table are the best professional judgment, and are in rough order of magnitude. It is not possible to ascertain costs with accuracy at this stage of the work due to a substantial amount of assumptions about the work required. The final design solutions and material selections have not yet been made available for the estimate.

RECOMMENDATIONS

- The entire building will be equipped with a fire sprinkler and a fire alarm system.
- Proper handrails, guards, nosing, markings, etc. should be added to stairs.
- All the doors to the bedrooms on the second floor should be modified and widened to meet exiting requirements.
- On the second floor, a second exit needs to be provided, possibly where the HVAC room exists.



ACCESSIBILITY ASSESSMENT

PROCEDURES FOR INVESTIGATION

Conforming to the recommended priority of actions detailed in the California code section, Accessibility for Existing Buildings, the following procedures for barrier removal investigation have been established:



Step 1. Review the existing architectural barriers within the path of access to the primary entrance. This includes the accessible parking space, the entrance ramp and the proper width for an entrance.

Step 2. Review the access within the building to public common areas and bedrooms. Items included are display racks, tables, Braille or raised character signage, visual alarms, etc.

Step 3. Review restroom access. This includes removal of barriers, relocation of toilet accessories, widening of doors, provisions for grab bars, etc.

DESCRIPTION OF TABLE

Following this section is a table of the accessibility assessment. The accessibility features are listed in an order roughly corresponding to the order of appearance in the sections of the 2007 California Building Code, Chapter 11B: Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing.

The interior features were evaluated first, followed by the exterior features. Each feature is checked for accessibility compliance and is assigned a number. Only the noncompliant features are keyed to the first and second floor plans following the table. For the noncompliant features, the reasons, the recommendations, the referenced code sections, the cost to correct the noncompliance and additional clarifying comments are listed.

TABLE ACCESSIBILITY ASSESSMENT

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
INTERIOR								
<i>ADAPTABLE DWELLING UNITS</i>								
1	Public and Common Use Areas							
1A	Living Room 102		X	No accessible route.	Provide accessible route.	1111B.2 1111B.4.2.1	See ³ .	One accessible route can link all the public and common use areas. The accessible route requires rearrangement of the plan, removal/addition of walls, doors, doorways, etc.
1B	Sitting Room 104		X	No accessible route.	Provide accessible route.	Same as above.	See ³ .	
1C	Dining Room 106		X	No accessible route.	Provide accessible route.	Same as above.	See ³ .	
1D	Kitchen 107		X	No accessible route.	Provide accessible route. Modify cabinets and sink.	Same as above. 1111B.4.4	See ³ .	
1E	Washer/Dryer 117		X	No accessible route and is inaccessible.	Provide accessible route and accessibility to laundry room.	Same as above.	See ³ .	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS	
		Y	N						
2	Bathrooms and Toilets								
2A	1 st Floor	Bathroom 112B		X	Not accessible.	Widen, provide roll-in shower, adjust fixture heights and door swing.	1111B.4.2.1 1115B.1	See ³	Public restrooms on the first floor are required to be accessible. 1111B.4.6
2B		Bathroom 114		X	Not accessible.	Provide roll-in shower, relocate toilet and sink.	Same as above.	See ³	
2C		Toilet 116		X	Not accessible.	Relocate toilet and sink.	Same as above.	See ³	
2D	2 nd Floor	Bathroom 201A		X	Not accessible.	No change.	1111B.4.6	--	Second floor to remain inaccessible to wheelchairs. 1134.B2
2E		Bathroom 203A		X	Not accessible.	No change.	Same as above.	--	
2F		Bathroom 207A		X	Not accessible.	No change.	Same as above.	--	
2G		Bathroom 209B		X	Not accessible.	No change.	Same as above.	--	
3	Accessible Bed			X	None existing.	Provide 36" clear width.	1111B.4.3	See ³	
4	Visual Alarms			X	None existing.	Provide visual alarm in accessible bedroom.	1111B.4.5.1	See ¹	
5	Visual Notification Devices			X	None existing.	Provide visual notification device in accessible bedroom.	1111B.4.5.2	See ¹	
6	Telephones			X	None existing.	Provide telephone in accessible bedroom.	1111B.4.5.3	See ¹	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					

FACILITY ACCESSIBILITY

7	Accessible Route of Travel			X	None existing.	Provide route.	1114B.1.2	See ³	The provision of the route is not an item that can be isolated. The addition affects other areas of the building.
8	Primary Entry Access								
8A	location	01		X	Not accessible.	Ramp needed to primary entrance.	1114B.1.3 1133.B.1.1	See ²	Only one (1) primary entrance to building is required in existing buildings.
8B		02		X	Not accessible.	No change.	1134.B21	--	
8C		05		X	Not accessible.	No change.	Same as above.	--	
8D		10		X	Not accessible.	No change.	Same as above.	--	
8E		11		X	Not accessible.	No change.	Same as above.	--	
8F		13		X	Not accessible.	Remove vestibule.	Same as above.	See ³	
9	Accessible Kitchen Sink								
9A	location	Kitchen 107		X	High and no clearance.	Remove existing cabinet. Provide new.	1115B.4.7	See ³	The kitchen sink is grouped with other kitchen work.

ITEM	ACCESSIBILITY FEATURE		COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
			Y	N					
9B		Kitchen 113		X	High and no clearance.	Remove existing cabinet. Provide new.	Same as above.	See ³	This kitchen is unnecessary and is to be replaced with other, more necessary program use.
10	Fixed Counter								
10A		Dining room 106		X	Too high.	Remove or lower to 34" max.	1122B.4	See ³	The counter is grouped with other kitchen work.
10B	location	Kitchen 107		X	Too high.	Remove or lower.	Same as above.	See ³	The counter is grouped with other kitchen work.
10C		Living room 111/ Kitchen 113		X	Too high.	Remove or lower.	Same as above.	See ³	The counter is grouped with other kitchen work.
11	Level Changes								
11A		Living Room 111 to Bedroom 112		X	Three steps above.	No change.	1124.B.2	--	
11B	1 st Floor	Living Room 102 to Sitting Room 104		X	The area by the stair in the Sitting Room is 1/2" above the Living Room.	No change.	Same as above.	--	The area can be accessed from two directions. While the doorway from the Living Room to the stair area is inaccessible, the doorway from the stair area to the sitting room provides an accessible route to the stair area.

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS	
		Y	N						
11C	2 nd Floor	Bedroom 203 to Bathroom 203a		X	6" above.	No change.	Same as above.	--	Second floor to remain inaccessible to wheelchairs. 1134.B2
11D		Hallway 205		X	6" above.		Same as above.	See ⁴	
12	Carpet								
12A	1 st Floor	Living Room 102		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	1124B.3	See ³	
12B		Nook 103		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	Same as above.	See ³	
12C		Sitting Room 104		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	Same as above.	See ³	
12D		Hallway 115		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	Same as above.	See ³	
12E		Living Room 111		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	Same as above.	See ³	
12F		Bedroom 112		X	Pile too high, low density, edge trim, backing, loop	Replace carpet with lo-pile, high density carpet	Same as above.	See ³	

ITEM	ACCESSIBILITY FEATURE		COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
			Y	N					
12G	2 nd Floor	Bedrooms and Hallways		X	Pile too high, low density, edge trim, backing, loop	No changes.	Same as above.	--	Accessibility requires carpet replacement, however the second floor is to remain inaccessible to wheelchairs. 1134.B2
13	Storage								
13A		Closet 112A	X			No Change.	11125B.1	--	
13B	1 st Floor	Closet 115A		X	Out of reach.	Remove or provide closet with lower shelves.	Same as above.	See ³	Closet is removed.
13C		Pantry 108		X	Clearance.	Replace with sliding doors.	Same as above.	See ³	Pantry is changed to accommodate the accessible route and reorganization of the kitchen.
13D	2 nd floor	Closets		X	Not accessible.	No Change.	Same as above.	--	Second floor to remain inaccessible to wheelchairs. 1134.B2
14	Doors								
14A	1 st Floor	01: Living Room 102		X	36" x 80", Threshold too high	Replace threshold and door bottom.	1111B.4.2.3 1133B.2.2 11133B.8.6.2	See ³	
14B		02: Washer/Dryer 117		X	30" x 80"	Widen door.	1133B.2.2	See ³	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
14C	03: Toilet 116		X	32" x 80", clear on pull side.	Relocate sink.	1133B.2.4.2	See ³	
14D	04: Bathroom 114		X	30" x 80"	Widen door.	1133B.2.2	See ³	
14E	05: Bathroom 114		X	32" x 80", clear on pull side.	Remove Jacuzzi.	1133B.2.4.2	See ³	
14F	06: Closet 115A		X	36" x 80"	To be removed.	1133B.2.2	See ³	
14G	07: Hallway 115		X	30" x 80", clear on pull side.	Relocate door.	1133B.2.4.2	See ³	
14H	08: HVAC 111A	X		24" x 70"		1133B.2.2	See ³	
14I	09: Bedroom 112		X	30" x 80"	Widen door.	Same as above.	See ³	
14J	10: Bedroom 112		X	24" x 80"	Widen door.	Same as above.	See ³	
14K	11: Bedroom 112	X		36" x 80"	No change.	Same as above.	See ³	
14L	12: Living Room 111		X	36" x 80", clear on push side.	Remove door 13.	1133B.2.4.2	See ³	
14M	13: Vestibule 110		X	36" x 80"	Remove.	1133B.2.2	See ³	
14N	14: Hallway 115		X	30" x 80"	Widen door.	Same as above.	See ³	
14O	15: Hallway 109		X	30" x 80", clearance.	Change swing.	Same as above.	See ³	

1st Floor

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS	
		Y	N						
14P	2 nd Floor	16: Bedroom 207		X	28" x 80"	No change.	1133B.2.2	See ⁴	Second floor to remain inaccessible to wheelchairs. 1134.B2
14Q		17: Bathroom 207A		X	26" x 80"	No change.	Same as above.	--	
14R		18: HVAC 208		X	24" x 80"	No change.	Same as above.	See ⁴	
14S		19: Hallway 209A		X	30" x 80"	No change.	Same as above.	See ⁴	
14T		20: Bathroom 209B		X	28" x 80"	No change.	Same as above.	--	
14U		21: HVAC 206		X	32" x 79"	No change.	Same as above.	--	
14V		22: Storage 204		X	28" x 80"	No change.	Same as above.	--	
14W		23: Bedroom 201		X	28" x 80"	No change.	Same as above.	See ⁴	
14X		24: Closet 201B		X	89 1/4" x 80"	No change.	Same as above.	See ⁴	
14Y		25: Bathroom 201A		X	28" x 80"	No change.	Same as above.	--	
14Z		26: Closet 201C		X	30" x 80"	No change.	Same as above.	See ⁴	
14AA		27: Bedroom 203		X	30" x 80"	No change.	Same as above.	See ⁴	
14BB	28: Bathroom 203A		X	25" x 80"	No change.	Same as above.	--		

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					

15	Doorways								
15A	1 st Floor	Living Room 102 Dining Room 106		X	31" x 80"	Widen opening.	1133B.3.1	See ³	
15B		Kitchen 107 Hallway 109	X		46" x 80"	No change.	1133B.3.1	See ³	
15C		Living room 102 Nook 103	X		36" x 80"	No change.	1133B.3.1	See ³	
15D		Living Room 102 Sitting Room 104 (1)	X		48" x 80"	No change.	1133B.3.1	See ³	
15E		Living Room 102 Sitting Room 104 (2)		X	24" x 80"	Widen opening.	1133B.3.1	See ³	
15F		Sitting Room 104 Stair	X		39 ¼" x 80"	No change.	1133B.3.1	See ³	
15G		Sitting Room 104 Washer/Dryer	X		86" x 80"	No change.	1133B.3.1	See ³	
15H		Living Room 111 Kitchen 113	X		36" x 80"	No change.	1133B.3.1	See ³	
15I	2 nd Floor	Doorways		X		No change.	1133B.3.1	See ⁴	Second floor to remain inaccessible to wheelchairs. 1134.B2

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					

16	Stairs								
16A	location	Porch 101		X	Handrails, markings.	Provide handrails, markings, non slip treads.	1133B.4.1.1 1133B4.4	See ⁴	
16B		Stair 105		X	Handrails not on both sides.	Provide handrails.	1133B.4.1.1	See ⁴	
16C		Living room 111		X	Handrails not on both sides.	Provide handrails.	1133B.3.1	See ⁴	
17	Signage								
17A		Stair 105		X	None existing.	Provide tactile floor designation signs at each floor level.	1133B.4.3	See ⁴	
18	Corridors								
18A	1 st Floor	Hallway 109	X		Existing 4'-4 1/4" > 3'-0" required.	No change.	1118B.1	See ³	
18B		Hallway 115		X	Existing 2'-5 1/2" < 3'-0" required.	Widen corridor to 3'-0"	1133B.3.1	See ³	
18C	2 nd Floor	Hallway 202	X			No change.	1133B.3.1	See ³	Second floor to remain inaccessible to wheelchairs. 1134.B2
18D		Hallway 205	X			No change.	1133B.3.1	See ³	
18E		Hallway 209A	X			No change.	1133B.3.1	See ³	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS	
		Y	N						
19	Ramp		X	None existing.	Provide ramp to primary entrance.	1133B.5	See ²		
EXTERIOR									
20	Exterior Path of Travel								
20A	location	01		X	Not accessible.	Provide ramp.	1127B.1	See ²	
20B		patio		X	Not accessible.	Provide path.	1127B.1 1111B.2 1111B.4.2.1	--	Need only one (1) primary path. 1134.B.21
20C		05		X	Not accessible.	No change.	1127B.1	--	
20D		10		X	Not accessible.	No change.	1127B.1	--	
20E		11		X	Not accessible.	No change.	1127B.1	--	
20F		13		X	Not accessible.	Remove.	1127B.1	--	
21		Accessible Parking		X	None existing.	Provide one parking space.	1129B.1	See ²	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					
22	Stair							
22A	To Porch 101		X	Handrail and stair markings.	Provide handrails, stair markings, non slip treads.	1127B.3 1133B.4 1133B.4.1.1 1133B.4.4	See ²	
22B	To Door 10		X	Handrail and stair markings.	Provide handrail and stair markings.	1127B.3 1133B.4	See ²	
23	Signage		X	None existing.	Provide sign to accessible entrance.	1127B.2	See ³	
23A	location	01	X	None existing.	Provide sign to accessible entrance.	1114B.1.4 1117B.5.8.1 .2 1127B.2	See ⁴	
23B		02	X	None existing.	Provide sign.	1114B.1.4 1117B.5.8.1 .2 1127B.2	--	
23C		05	X	None existing.	Provide sign.	1114B.1.4 1117B.5.8.1 .2 1127B.2	--	
23D		10	X	None existing.	Provide sign.	1114B.1.4 1117B.5.8.1 .2 1127B.2	--	

ITEM	ACCESSIBILITY FEATURE	COMPLIANCE		ISSUE	RECOMMENDATIONS	CODE SECTION	COSTS	REMARKS
		Y	N					

23E	11		X	None existing.	Provide sign.	1114B.1.4 1117B.5.8.1 .2 1127B.2	--	
23F	13		X	None existing.	Provide sign.	1114B.1.4 1117B.5.8.1 .2 1127B.2	--	

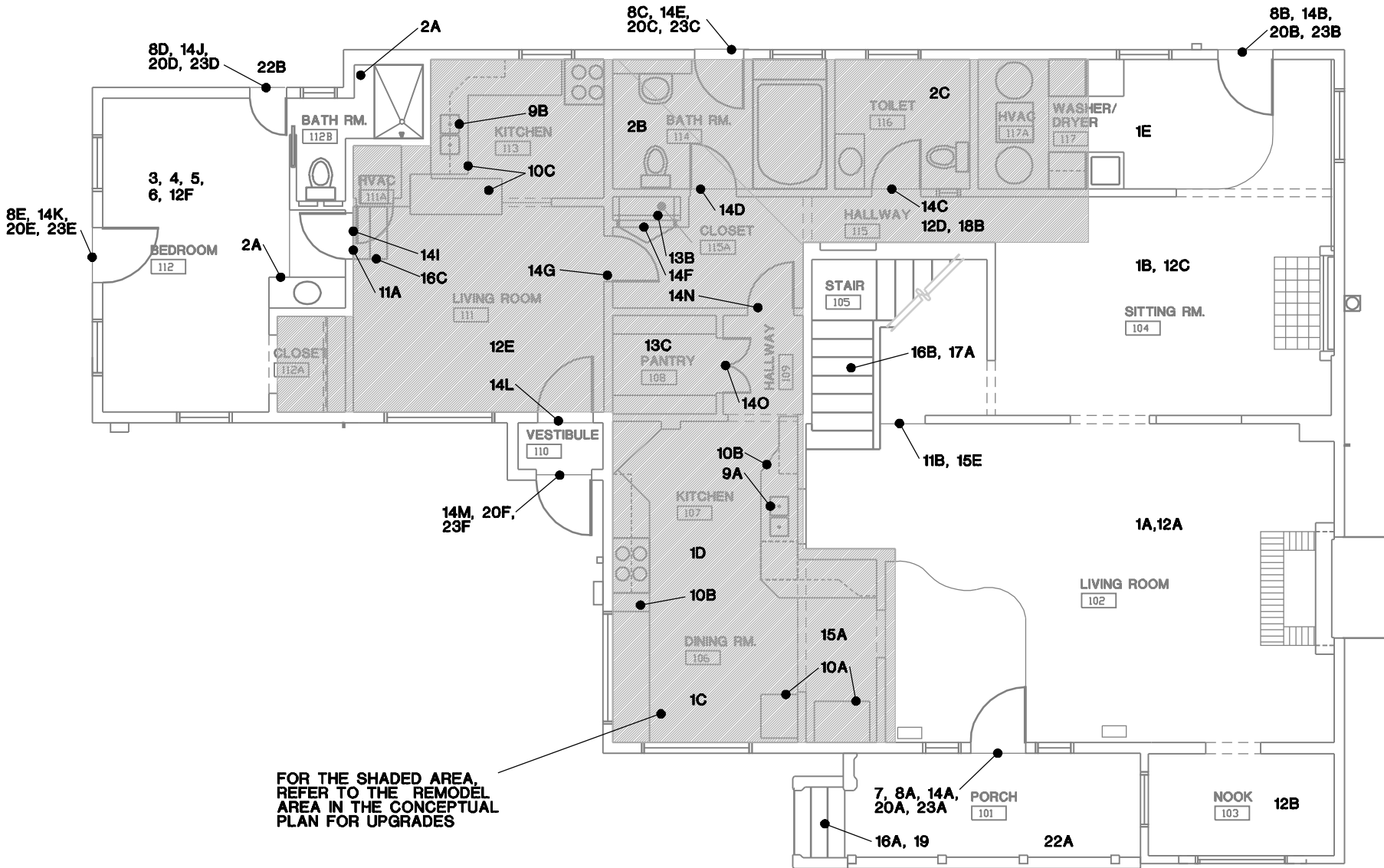
NOTES

¹ See the Electrical section.

² Included in the SITE UPGRADES cost estimate, a lump sum figure. This amount includes the addition of the asphalt driveway, the wraparound covered front porch, ramp, the back patio, the BBQ area, the conversation pit and the lower patio.

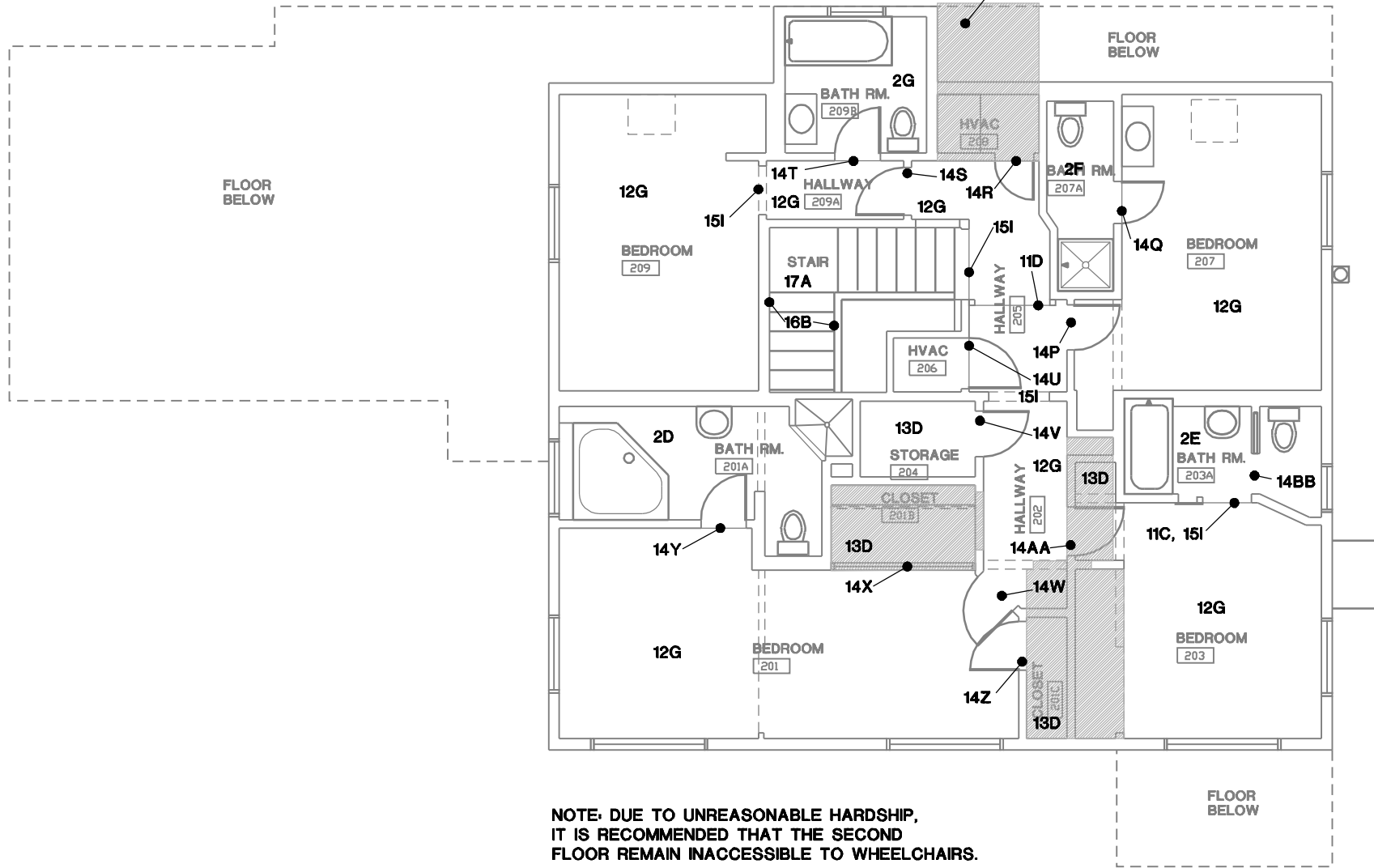
³ Included in INTERIOR UPGRADES cost estimate. This amount includes the removal, relocation, and addition of these elements: walls, windows, doors, doorways, cabinets, carpet and fixtures. Ceiling, floor and wall finishes are also included.

⁴ See the Fire Life Safety section.



FOR THE SHADED AREA,
REFER TO THE REMODEL
AREA IN THE CONCEPTUAL
PLAN FOR UPGRADES

FOR THE SHADED AREAS,
REFER TO THE REMODEL
AREA IN THE CONCEPTUAL
PLAN FOR UPGRADES



NOTE: DUE TO UNREASONABLE HARDSHIP,
IT IS RECOMMENDED THAT THE SECOND
FLOOR REMAIN INACCESSIBLE TO WHEELCHAIRS.

SUMMARY

The majority of the house, the first and second floor, and the site plan are not ADA accessible.

The deficiencies are described and explained, as follows:

SITE ACCESSIBILITY AND ACCESSIBILITY PATH:

- The parking lot lacks an accessible parking space near the main entrance.
- The facility lacks an accessible route of travel to the primary entry.

ARCHITECTURAL BARRIER REMOVAL:

- All public-use and common-use areas, the bedroom and the restrooms are not accessible. The current plan lacks an accessible route to all the public and common use areas.
- There is no existing accessible bedroom. The accessible bedroom is to have a minimum clear floor space of 36 inches along each side of the bed, and shall provide an accessible route to each side of the bed.
- Building corridor travel paths are not wide enough to accommodate wheelchairs.
- Many of the existing doors and doorways are found to be unacceptable, particularly the clearance and hardware.
- In general, many of the following items do not comply with ADA accessibility: kitchen sinks, counters, level changes, carpet, storage, stairs, and signage.

RESTROOM BARRIER REMOVAL:

- The existing bath facilities are found to be unacceptable because of fixtures, clearances, and/or size.
- At least one of the existing toilet rooms is required to be accessible to persons with disabilities. The room should be large enough to allow a wheelchair turnaround, which requires 60 inches in diameter. Grab bars are to be provided. The minimum door clear opening is 32 inches. Actual door size, including hardware, is to be 36 inches to provide the required clearance.
- Rather than replacing a toilet that is too low, installing spacers to raise the seat may be sufficient. Sink modifications include a mounting height of at least a 27-inch clearance to allow a wheelchair to roll under. Relocate sink handles if necessary for easy reach and use. Soap dispensers, towels and similar items must be remounted to provide a maximum height of 44 inches from the floor. Wrap all exposed hot-water pipes under the sink with insulation to avoid injuring those using a wheelchair.

ALTERNATIVES TO BARRIER REMOVAL:

- ADA requires programs and services to be accessible, not buildings. A modification may not be required. Barrier removal is required in existing buildings only when readily achievable; that is, without much difficulty or expense.
- Persons may retrieve items from displays within reach as an alternative to remodeling shelves. Materials may be relocated to accessible areas. An alternative to moving a washroom towel dispenser on a wall is placing a supply of paper towels in an accessible location at the sink.

RECOMMENDATIONS

The areas of ADA accessibility noncompliance, unlike the Life Safety deficiencies, should not be resolved item by item, in the order listed in the Accessibility Assessment table. The solutions are necessarily more complex and usually require reorganization of and relocation within the floor plan. Proposing solutions in isolation would adversely affect other architectural issues such as room adjacencies, program use and building circulation.

The recommendations are derived from the accessibility deficiencies, and therefore essential in bringing the building up to code. Based on the survey and analysis of the existing conditions, IDAS recommends the following changes:

- **SITWORK**

The parking space striping and signage should be modified to provide for an 8-foot-wide space with a 60-inch access aisle and at least one accessible parking space near the main entrance. General public parking should be relocated to make room for an accessible parking space near the front entrance.

A ramp is required. The expanded front porch could wrap around the front, linking entrances, making both the primary and the secondary entrances accessible.

- **1ST FLOOR**

The entire first floor is required to be made fully accessible with the addition of ramps, widening of corridors and doors, addition of an accessible bedroom and bathroom, stair handrails and markings, and exit signs.

Relocating the laundry room links it to an accessible route and makes it accessible. In its current location, the laundry room is obstructing the HVAC room which needs to be enclosed and accessed for maintenance. When relocated to another part of the house, an accessible, more spacious laundry room can be provided.

In place of the existing laundry room, a public accessible restroom can be added. Toilet 116 is not accessible because it is entered from a narrow hallway. Moving either walls, the hallway's east wall supporting the stairway or the hallway's west wall, most likely a structural bearing wall, is not recommended.

Bathroom 114 should be converted to an accessible bathroom through replacement of inaccessible fixtures and relocation of walls to provide wheelchair clearance.

Though Bedroom 112, the only existing bedroom on the first floor, seems like the easiest room to convert into an accessible bedroom, its remodel requires a costly chair lift. The bathroom attached to Bedroom 112 would also require extensive remodeling to be made accessible. Bedroom 112's conversion would create an awkward, hardly usable room between the accessible bedroom and Hallway 115. Instead, the accessible bedroom is recommended to be located where Kitchen 113 exists. Consequently, the new accessible bedroom's placement affects the surrounding areas. The plan must then be reorganized to create an accessible path from the primary and secondary entrances. Corridors are widened and walls, windows, and doors will likely be removed or relocated.

The countertops, appliances and fixtures in the bathrooms should be replaced or relocated to meet accessibility requirements.

Since all the countertops, appliances and fixtures in Kitchen 107 are required to be replaced, it is recommended, for economy and efficiency, that the kitchen be completely remodeled and reorganized instead of each item being replaced element by element in its existing location.

The high pile and low density carpet must be replaced.

- 2ND FLOOR

If any major alteration is made to the second floor, code requires that the floor be made fully accessible, involving major provisions for an elevator or a lengthy ramp. Either option is infeasible for a renovation of this size, scope and budget.

Unreasonable hardship exists in making the second floor, which consists of four bedrooms, accessible to wheelchairs. Therefore, we recommend that any alteration be limited in size and be primarily for improving life safety features and providing emergency exiting only. Alternatively, a fully accessible bedroom can be provided on the first floor.

COST ESTIMATES

While it is possible to give a rather definite cost figure to fix specific problems, such as enlarging the door, it is not possible, at this juncture, to pinpoint the dollar figures of subsequent consequences from that door enlargement to the surrounding wall construction and space.

Compared to the Fire Life Safety costs, the cost estimates for ADA accessibility upgrades are more complex and less straightforward. The solutions require major reconfiguration of the floor layout and relocation of room functions. Therefore, cost estimates are calculated based on the conceptual schemes rather than the accessibility assessment chart. The few items that could be easily estimated, if any, are shown in the costs column. Where substantial changes were made to the plan to correct several deficiencies simultaneously or eliminate deficiencies entirely, refer to the footnotes in the cost column and the remodel costs at the end of the report.



STRUCTURAL EVALUATION

BUILDING DESCRIPTION

On Tuesday, August 19th, 2008, ABS Consulting surveyed the structure located at 578 Edgemoor Road in Big Bear City, California. Since no original structural or architectural drawings were available for review, the existing construction was verified through observations of accessible portions of the building. The interior rooms and exterior perimeter, including accessible portions of the sub-floor crawl space beneath the building structure, were visually investigated during the site visit. Also, engineering judgment of construction of similar building structures of this age was employed since most of the existing structural elements are concealed by architectural finishes.

Gravity System

The house appears to consist of an original structure with subsequent additions. Judging from the sub-floor construction, the original building appears to be the rear portion of the first floor, bounded by Pantry 108 and Bathroom 114 on the south end and Sitting Room 104 on the north. (Please note that these room designations are per the existing floor layout.) The boundary of this two-story portion is approximately 40 feet by 19.5 feet, supported by a 6-inch thick concrete stem wall foundation. The crawl space beneath the foundation has a clear height that varies between approximately 1'-6" and 2'-6". The sub-floor is constructed of 1x6 straight sheeting supported by 2x6 floor joists spaced at approximately 16 inches on center. The floor joists span between interior 4x4 beams and perimeter 2x6 wood sills atop of the stem walls. The beams are supported on 4x4 wood posts and concrete piers. The 2x6 wood sills appear to be anchored to the stem walls with 1/2" diameter cast-in-place anchor bolts spaced at about 6 feet on center. An additional concrete stem wall segment provides support for the south bearing wall of Sitting Room 104.

It is difficult to determine the second floor framing in this area as it is entirely concealed beneath architectural finishes. However, framing would likely consist of 2x floor joists spanning between 2x stud bearing walls. The roof structure is constructed of plywood sheeting supported by 2x8

rafters spanning between bearing walls and ridge beams. King posts provide intermediate support for the ridge beams. The walls appear to be constructed of 2x woods studs.

The house's two-story front portion, bounded by the Kitchen 107 and Dining Room 106 on the south end and Living Room 102 on the north, appears to be of newer construction. (Please note that these room designations are per the existing floor layout.) The foundation for this approximately 40 foot by 17.5 foot perimeter consists of an 8-inch thick concrete stem wall footing which provides for a crawl space with a clear height of between approximately 1 foot at the south end and upwards of 3 feet at the north-east corner. The sub-floor is constructed of plywood supported by 2x6 floor joists spaced at approximately 16 inches on center. The floor joists span between 4x6 interior beams and perimeter 2x6 wood sills atop of the stem walls. The beams are supported on 4x4 wood posts and concrete piers as shown in *Figure 1* below. The 2x6 wood sills appear to be anchored to the stem walls with ½" diameter cast-in-place anchor bolts spaced around 6 feet on center.

The second floor is constructed of 1x6 straight sheeting supported by 4x10 joists spaced at 2 feet on center. The floor joists span between the east and west bearing walls of Living Room 102. Floor framing above the Kitchen and Dining Room could not be verified due to the presence of hard ceilings. The roof appears to be constructed of plywood sheeting supported by 2x rafters spanning between bearing walls and ridge beams. King posts shown in *Figure 2* provide support for the ridge beams. The walls appear to be constructed of 2x woods studs.

The house's one-story southernmost portion containing Bedroom 112, Closet 112A and Bathroom 112B (*Figure 3*) appears to have been a separate building at one time. (Please note that these room designations are per the existing floor layout.) Access to the crawl space beneath the sub-floor was not possible since the CMU block stairs at the exterior west door block the access hatch. However, it is reasonable to assume that the construction is similar to that of the original portion of the house. It should be further noted that the presence of perimeter concrete sill walls could not be verified since the combination of siding and 2x pressure treated wood extended down to the soil surface. The gabled roof is likely constructed of 2x rafters that bear directly on the south and north 2x stud walls.

The addition that encompasses Kitchen 113 and Living Room 111 (*Figure 4*) is constructed atop a concrete slab-on-grade with 2x stud walls. Please note that these room designations are per the current floor layout. The roof appears to be constructed of plywood sheathing supported by 2x rafters spanning between the east and west exterior bearing walls and a central ridge beam.

Judging from the construction, the newest addition appears to be the one-story Nook 103 located at the northeast corner of the building. This approximately 10 foot by 5.5 foot room is supported by a 6-inch thick perimeter concrete stem wall foundation which provides for a crawl space of approximately 2'-6". The sub-floor is constructed of plywood sheathing supported by 2x6 floor joists spaced at approximately 16 inches on center. The floor joists span between exterior 2x6 wood sills atop of the stem walls. The 2x6 wood sills appear to be anchored to the stem walls with cast-in-place anchor bolts. The roof appears to be constructed of plywood supported by 2x rafters spaced at 16" on center.



Figure 1: Typical Sub-Floor Construction



Figure 2: Typical Roof Construction



Figure 3: House's South Portion



Figure 4: Middle Slab-On-Grade House Addition

Lateral System

The lateral force resisting system for the house appears to consist of plywood diaphragms at the roof level and horizontal plywood or straight sheathing diaphragms at both the second and ground floors. These diaphragms distribute lateral forces to the vertical lateral force resisting elements. It is difficult to clearly determine the specific construction of the vertical lateral force resisting elements as they are concealed beneath architectural finishes. However, they would likely consist of either wood let-in braces, or plywood or gypsum board shear walls. Judging from the age of the building, a combination of let-in braces and gypsum board shear wall are the likely system. It should be noted that the plywood roof diaphragm appears to double as the west wall for much of the second floor due to its steep incline. In addition, the exterior siding at the first floor could provide lateral shear resistance if properly nailed. Lateral forces collected in the vertical force resisting elements are subsequently transferred to the concrete stem wall foundations and surrounding soil.

FINDINGS AND RECOMMENDATIONS

The roof and floor diaphragms appear to have reasonable aspect ratios and as a result, should have adequate capacity to resist seismic shear loads without requiring additional strengthening. Additionally, no strengthening appears to be required at the second story west wall due to the geometry of the roof.

The following list presents a summary of observed deficiencies in the house's lateral force resisting system along with recommended mitigation measures:

- The existing vertical lateral force resisting elements could not be determined due to the architectural finishes but are judged to likely be overstressed. Therefore, it is recommended that the existing exterior siding or interior gypsum board be removed in selected locations on both the first and second levels for the installation of plywood sheeting with hold-down anchorage at each end. Additional nailing will also be required through the bottom 2x sills. Please refer to the solid and dashed blue lines in *Figures 5 and 6* below for proposed locations of these new shear walls for the remodel schemes. The blue lines are located on the side of the wall where the plywood sheeting is proposed.
- Shear transfer between the new shear wall elements and the existing concrete sill wall is likely inadequate. Therefore, installation of new sill plate straps screwed to the side of the existing 2x sill and anchored with expansion bolts to the side of the concrete sill is recommended where shown in *Figure 5*.
- Existing wall double top plates may not have the capacity to collect shear loads from the roof diaphragm and deliver them to the proposed shear walls. Therefore, it is recommended that 18 gage coil straps be nailed to the sides of the top plates at the identified locations shown in *Figure 6*. Additionally, blocking between the roof rafters at the perimeter walls will need to be strapped to the wall top plates.

In addition to the strengthening recommendations presented above, limited destructive investigation, consisting of removal of some of the drywall ceiling is required to better identify the existing floor framing sizes, directional span and location of bearing in a few critical locations identified by green circles in *Figure 5* below. This survey will help determine whether new beams shown by yellow lines in *Figure 5* are required to support the existing floor framing due to

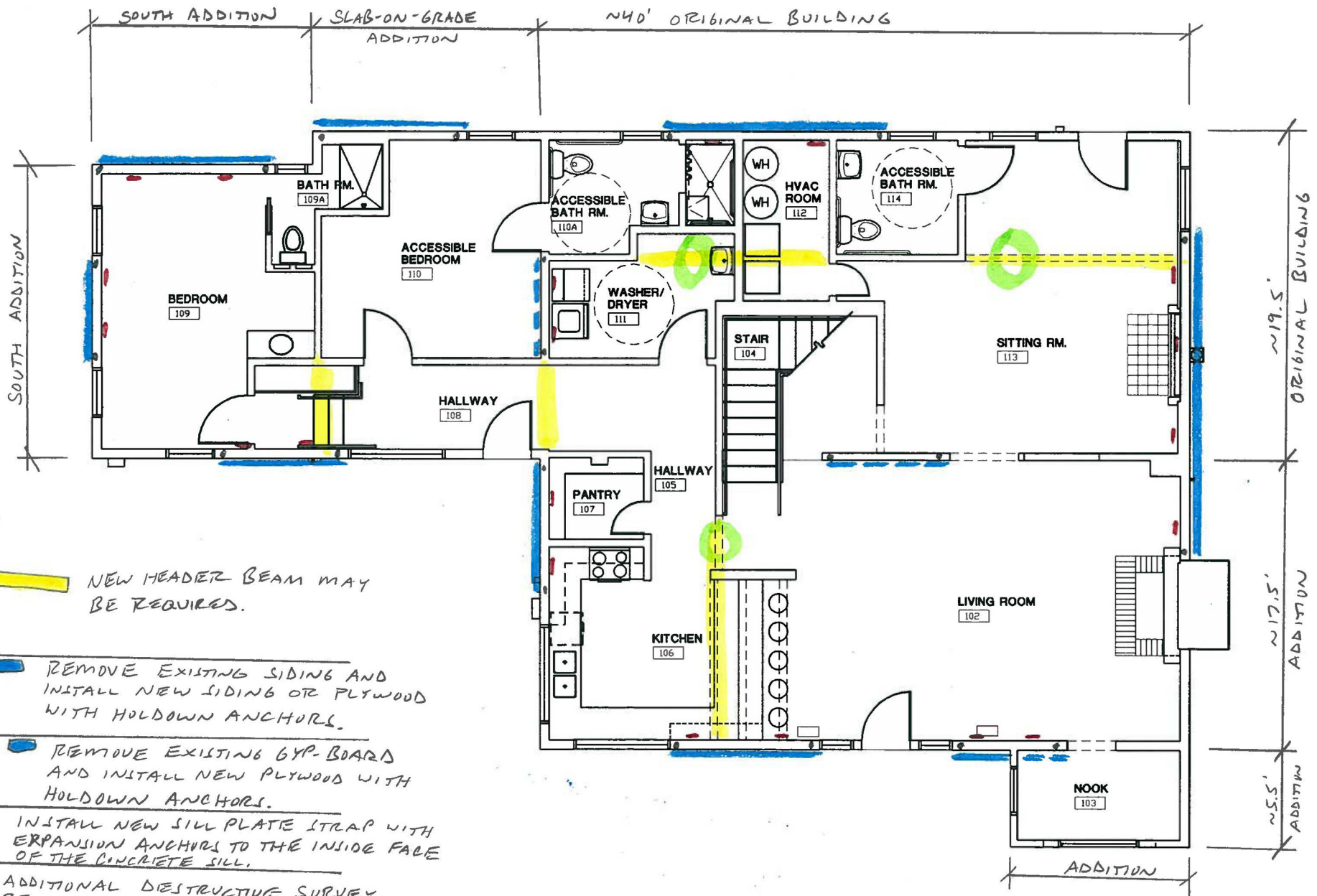
the removal of existing walls in the proposed architectural remodel. Also, in order to verify the sub-floor construction of the house's southern single story portion, the CMU stair will need to be moved to allow for access to the crawl space.

These are general recommendations and are not finalized for construction. Before retrofitting this building, detailed calculations and construction documents would need to be executed.






COST ESTIMATES

The rough order of magnitude cost is as follows:

Strip off existing siding and replace with new at identified exterior shear walls = (\$10/ft ²) 30' x 8' at second floor plus 90' x 9' at first floor = 1,050 ft ² x \$10/ft ² =	\$12,000-\$15,000
Strip off existing gypsum board and replace with new plywood & gypsum board at identified interior shear walls = (\$10/ft ²) 10' x 8' at first floor = 80 ft ² x \$10 /ft ² =	\$900-\$1,200
Install hold-down straps at second floor shear walls (6 locations) = 6 x \$100 =	\$700-\$900
Install hold-down anchors at first floor shear walls (19 locations) = 19 x \$250 =	\$5,500-\$6,800
Install 18 gage coil straps where required	\$4,000-\$5,000
Install sill plate anchors at approximately 16 locations (\$200/plate) = 16 x 200 =	\$3,700-\$4,600
TOTAL	\$26,800-\$33,500

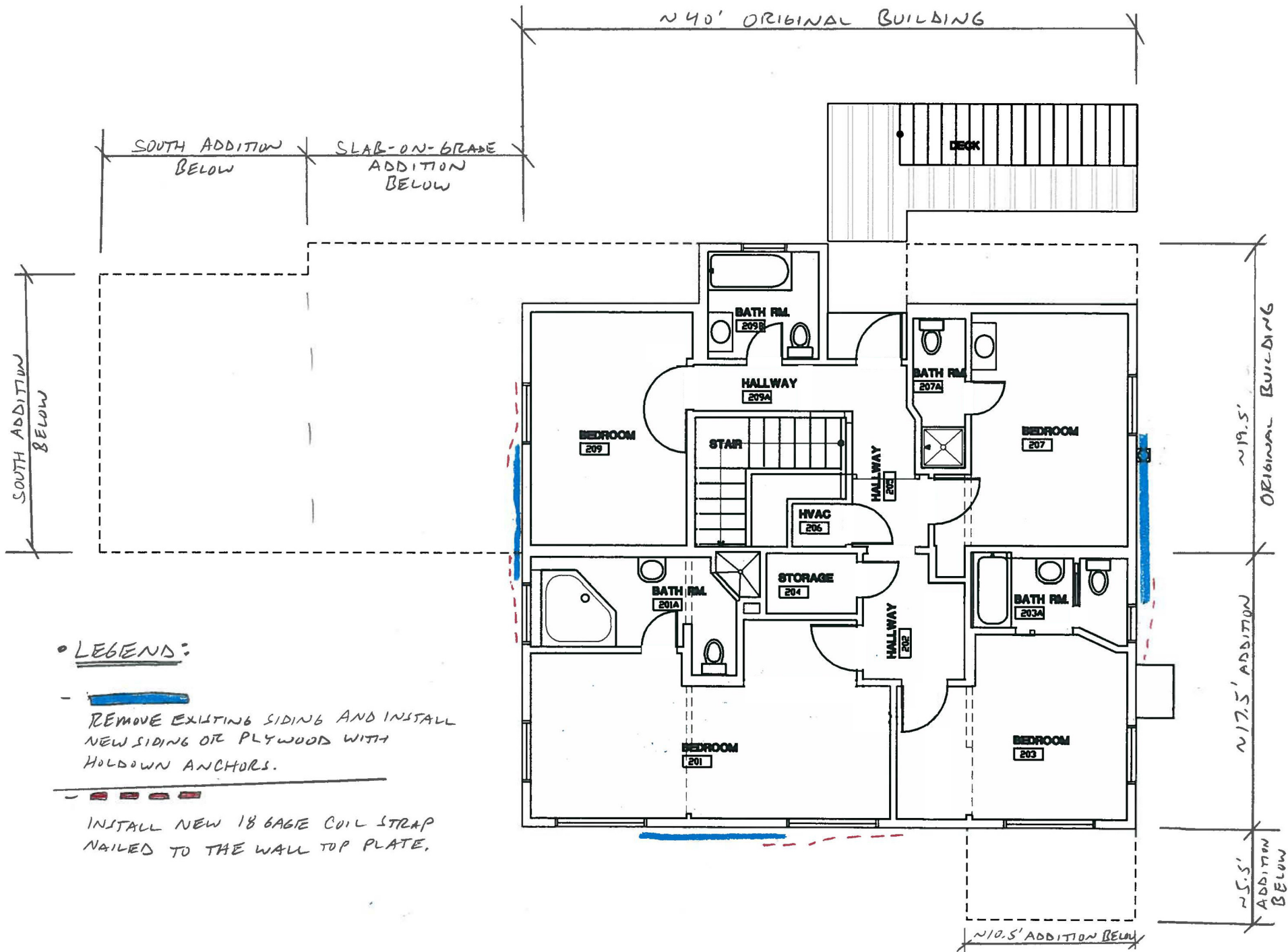


LEGEND:


-  NEW HEADER BEAM MAY BE REQUIRED.
-  REMOVE EXISTING SIDING AND INSTALL NEW SIDING OR PLYWOOD WITH HOLDOWN ANCHORS.
-  REMOVE EXISTING GYP. BOARD AND INSTALL NEW PLYWOOD WITH HOLDOWN ANCHORS.
-  INSTALL NEW SILL PLATE STRAP WITH EXPANSION ANCHORS TO THE INSIDE FACE OF THE CONCRETE SILL.
-  ADDITIONAL DESTRUCTIVE SURVEY REQUIRED TO VERIFY EXISTING 2ND FLOOR FRAMING CONSTRUCTION.


IDAS
 Institutional Design & Architectural Services
 2025 10th Street
 Riverside, CA 92501-3821
 Tel: (951) 343-9150 Fax: (951) 342-9127
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**UC RIVERSIDE BIG BEAR LAKE
 PROPERTY RENOVATION PROJECT
 PROPOSED 1ST FLOOR
 SEISMIC STRENGTHENING
 FIGURE 5**



LEGEND:

 REMOVE EXISTING SIDING AND INSTALL NEW SIDING OR PLYWOOD WITH HOLD-DOWN ANCHORS.

 INSTALL NEW 18 GAUGE COIL STRAP NAILED TO THE WALL TOP PLATE.

UC RIVERSIDE BIG BEAR LAKE
PROPERTY RENOVATION PROJECT
PROPOSED 2ND FLOOR
SEISMIC STRENGTHENING

FIGURE 6



Structural Design & Architectural Services
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Fremont, CA 94537-3821
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MECHANICAL AND PLUMBING EVALUATION

HEATING AND VENTILATING SYSTEMS

Following is a summary of the observations and evaluations of UCR Big Bear Property's heating, ventilating, and plumbing systems.

DESCRIPTION OF THE EXISTING SYSTEMS

The building has two heating systems and is not air-conditioned. The two-story portion of the building has a hydronic heating system that is interconnected with the domestic water heating system. Two gas-fired water heaters are located in the first-floor laundry room. Water Heater No. 1 is a Bradford White Model No. M4403T6FBN2 with an input heating capacity of 40 MBH and a storage capacity of 40-gallons. Water Heater No. 2 is an American Water Heater Company Polaris Residential water heater with an input heating capacity of 100 MBH and a storage capacity of 34-gallons. A piping manifold connects the water heaters.

The heating system for the first floor consists of a MOR/FLO AMERICAN Air Heater fan-coil unit (no name plate data was available) located in the same space as the water heater. The fan-coil unit is connected to the piping manifold together with a Grundfos inline circulating pump. The fan-coil unit supplies heated air to the first floor through galvanized metal ducts located in the crawl space; the air is supplied through floor grilles located throughout the first floor. The air is returned to the fan-coil unit through a grille located on the second floor in a closet with a louver door; the air is ducted back to the fan-coil unit through a 16-inch diameter uninsulated galvanized metal duct. A wall-mounted electric thermostat located on the wall of the Sitting Room, Room 104, controls the supply fan and circulating pump.

The heating system for the second floor consists of a MOR/FLO AMERICAN Air Heater fan-coil unit (no name plate data was available) located in a closet on the second floor. The fan-coil unit is connected to the first floor hot water piping manifold together with a Grundfos inline circulating pump. The fan-coil unit supplies heated air to the second floor through galvanized metal ducts



located in the attic; the air is supplied through ceiling-mounted diffusers and registers located throughout the second floor. The air is returned to the fan-coil unit return plenum through a grille located in an adjacent closet with a louver door. A wall-mounted electric thermostat located in the Hallway controls the supply fan and circulating pump.

The heating system for the single story portion of the building consists of the Day and Night Model No. 100U19 gas-fired furnace located in a closet that opens to the Living Room, Room 111. The furnace has an input of 100MBH. The fan-coil unit supplies heated air through galvanized metal ducts located in the attic; the air is supplied through ceiling-mounted diffusers and registers located throughout the space. The air is returned to the fan-coil unit return plenum through a grille located in the wall below the furnace closet door. A wall-mounted electric thermostat located in the Bedroom, Room 112, controls the furnace. The furnace was installed in 1989.

These heating systems are supplemented by a wood-burning Sherwood Ironwork Victoria Model stove in the Sitting Room, Room 104, and a wood-burning fireplace in the Living Room, Room 104, fitted with a metal firebox. Living Room, Room 111, has a freestanding electric heater.

SYSTEMS EVALUATION

The HVAC equipment in general appears to be in good operating condition. The age of the fan-coil units is unknown. The gas-fired furnace is 19-years old. The estimated service life of gas-fired furnaces is 18-years per the 2003 ASHRAE HVAC Applications Handbook.

All bathrooms have either an operable window or a ceiling-mounted exhaust fan. Some bathrooms have both.

The range in the main kitchen has a residential range hood. The gas-fired range in Kitchen, Room 113, does not have a range hood.

The only observed defect is in the return air plenum for the first floor fan-coil unit. The return air plenum is constructed of fiberglass duct board. The seams have failed.

The integrity of the duct systems cannot be determined. Those ducts that could be observed appear to be in satisfactory condition but portions of the ductwork are uninsulated.

The estimated heating load for the two-story portion of the building is 129,930 BTUH. The two gas-fired water heaters that have a total heating capacity of 130,000 BTUH provide the heating for this portion of the building. The water heaters also provide the domestic hot water for the building. The estimated domestic water-heating requirement is 136,250 BTUH as detailed in the plumbing portion of this evaluation.

The total heating demand for the two water heaters is 266,180 BTUH. The wood burning stoves in the Sitting Room and the Living Room augment the heating system. The heating system capacity is marginal.

The estimated heating load for the single-story portion of the building is 27,460 BTUH. The heating capacity of the gas-fired furnace that serves this portion of the building is 75,000 BTUH. The system has adequate heating capacity.

RECOMMENDATIONS

- Insulate all ductwork for compliance with the requirements of Title 24, Energy Conservation Standards.

Estimated Construction Cost = \$5,700.00 - \$7,000.00

- Repair damaged Fan/Coil unit return Plenum

Estimated Construction Cost = \$500.00

- Provide additional heating capacity.

Option 1: Increase the size of the domestic hot water heaters to include the space heating requirements.

Estimated Construction Cost = \$9,500.00 - \$11,000.00

Option 2: Replace the fan-coil units with gas-fired furnaces and separate the space heating system from the domestic water heating system.

Estimated Construction Cost = \$12,500 - \$15,000.00

PLUMBING SYSTEMS

DESCRIPTION OF THE EXISTING SYSTEMS

A 4-inch sewer lateral from the sewer main located in Edgemoor Road serves the building. The site actually has six (6) sewer laterals based on the information provided by the Big Bear Lake Public Works Department.

A ¾-inch water service from a 2-inch water main located in Glenview Road with a 5/8-inch water meter serves the building. An 8-inch water main is located in Edgemoor Road. The water pressure at this location is reported to be 100 to 105 PSI. This data is based on information provided by the Department of Water and Power. The water piping is copper.

The building has a ¾-inch natural gas service. The gas service supplies a furnace, two (2) water heaters, a dryer, and two (2) ranges. The gas piping is schedule 40 steel pipe and is routed in the crawl space.

The waste and vent piping material is ABS. Portions of the piping are exposed in the Laundry Room.



Two (2) gas-fired water heaters provide domestic hot water for the building. These water heaters also provide the space heating for the two-story portion of the building. The water heaters are located in the first-floor laundry room. Water Heater No. 1 is a Bradford White Model No. M4403T6FBN2 with an input heating capacity of 40 MBH and a storage capacity of 40-gallons. Water Heater No. 2 is an American Water Heater Company Polaris Residential water heater with an input heating capacity of 100 MBH and a storage capacity of 34-gallons. A piping manifold connects the water heaters. Each water heater is provided with two (2) seismic restraint straps secured to the wall.

The building has seven (7) bathrooms. Two (2) bathrooms have a flush tank water closet, lavatory, and shower. Two (2) bathrooms have a flush tank water closet, lavatory, and a bathtub with a shower. Two (2) bathrooms have a flush tank water closet, lavatory, and a Jacuzzi-type bathtub. One (1) bathroom has a flush tank water closet and a lavatory together with a rough in for a bathtub but no bathtub. There are two (2) kitchens. The main kitchen has a double compartment sink with a garbage disposal and a water filtration system and a gas-fired range with a range hood. The kitchen in the one-story portion of the building has a double compartment sink with a garbage disposal and a gas-fired range without a range hood. The other fixture is a clothes washer located in the first floor laundry room, Room 117.

The plumbing fixtures are not ADA compliant.

SYSTEMS EVALUATION

Equipment, Fixtures, Trim, and Piping

The water heaters, fixtures, trim, and piping appear to be in satisfactory condition. No evidence of leaks, corrosion, or deterioration was observed. All of the gas appliances are provided with local shut-off valves. The hot water supply piping is only partially insulated.

California Plumbing Code

The following items were noted that are at variance with the current California Plumbing Code (CPC).

1. The water pressure to the building is 100 to 105 PSI. Per CPC Section 608.2 the water pressure shall be regulated to not more than 80 PSI. An approved pressure regulator with a strainer is required. If a pressure regulator is installed, a pressure relief device will be required per Section 608.3.
2. CPC Section 508.4 requires that water heaters set on a floor-sub-floor assembly be installed in a corrosion resistant pan drained to an approved location. The water heaters are sitting on a floor-sub-floor assembly and are not installed in such a pan.
3. The connection to the landscape irrigation system does not include a backflow protection device per CPC Section 603.4.6.

Domestic Cold Water System

A total of 54.5 fixture units are connected to the water system. The existing water service has a 5/8-inch meter and a 3/4-inch building supply per the DWP records. A 1-inch water meter and a 1-1/4-inch building supply are required per CPC Table 6-6. The water piping distribution needs to be increased to comply with the sizing requirements of Table 6-6 and for good practice.

Domestic Hot Water System

The two gas-fired water heaters have a total heating capacity of 130,000 BTUH. They provide the heating for this portion of the building and provide the domestic hot water for the entire building. The estimated heating load for the two-story portion of the building is 129,930 BTUH.



The water heating system needs to be increased in size and capacity. It is assumed the water heating demand will be significant because of the location and winter activities. It is assumed the building will have 2 guests per bedroom for a total of 14. After a day of outdoor activities, all the guests will want a shower within a short period of time, in addition to washing their clothes. On this basis, at least 265 gallons of hot water may be required within a 20 to 30 minute period.

The hot water distribution piping needs to be insulated for compliance with California Title 24, Energy Conservation Standards.

Natural Gas System

The building has a ¾-inch natural gas service. The natural gas system has a connected load of 405 MBH. A 1-1/4-inch natural gas supply to the building is required per CPC Table 12-7. The natural gas distribution piping needs to be increased for compliance with Table 12-7.

RECOMMENDATIONS

- Correct the following CPC deficiencies:
 1. Provide a pressure regulator for the water service to maintain the pressure less than 80 PSI together with a pressure relief device.

Estimated Construction Cost = \$800.00

2. Provide a corrosion-resistant pan with drain for each of the water heaters.

Estimated Construction Cost = \$300.00

3. Provide a backflow prevention device for the landscape irrigation.

Estimated Construction Cost = \$1,500.00



4. Provide ADA compliant plumbing fixtures and trim as required.

- Provide a new water meter, building service, and distribution piping sized per the requirements of the CPC. The water meter will be sized by the Utility.

Estimated Construction Cost = \$12,500.00 - \$15,000.00

- Replace the existing domestic hot water heaters.

Option 1: Provide three (3) direct vented, heavy-duty, tankless gas-fired instantaneous water heaters rated at 199,900 BTUH each.

Estimated Construction Cost = \$27,000.00 - \$32,000.00

Option 2: Provide one (1) high efficiency, tank type, 130-gallon water heater with an input of 300,000 BTUH.

Estimated Construction Cost = \$17,500.00 - \$21,000.00

- Replace the domestic hot water piping with properly sized, insulated piping.

Estimated Construction Cost = 13,500.00 - \$16,000.00

- Natural Gas System

Provide new meter, building service, and distribution piping sized per the requirements of the CPC. The meter will be sized by the Utility.

Estimated Construction Cost = \$6,500.00 - \$8000.00

Automatic Fire Sprinkler

The City of Big Bear Lake is located in a Very High Fire Hazard Severity Zone as designated by CAL FIRE and the California State Fire Marshal's Office. An automatic fire sprinkler system is required based on the 2007 California Fire Code and the California Building Code. The automatic fire sprinkler system shall be in accordance with National Fire Protection Association (NFPA) Standard 13R. A common sprinkler/domestic water service is permitted. The size of the water service will be based on the higher of the system demands if separate piping systems are used and a means is provided to prevent domestic water flow when the fire sprinkler system is activated. Piping in any areas exposed to freezing shall be protected against freezing. A fire department connection is required.

Estimated Construction Cost = \$23,000.00 - \$27,000.00



ELECTRICAL EVALUATION

The University of California, Riverside (UCR) is converting an existing single family residential building into Recreation Facilities for UCR students and staff. The following is a summary of the existing conditions of the building, along with a summary of physical upgrades required by Code and programmatic needs of the University. The summary to the report will include several rough order of magnitude (ROM) costs for the electrical upgrades.

EXISTING CONDITIONS

The existing building being studied is a two story house with multiple kitchens, living areas, laundry, and bedrooms on both levels. There is a drive lane out front and a portable hot tub on the back patio. Currently, the electrical loads in the building are served by a 200A, 120/240V single phase panel located on the exterior of the building. The serving utility is Bear Valley Electric and it feeds the building from an overhead transformer approximately 350' from the building – the incoming line is overhead, entering the service panel from overhead via a utility weatherhead (see *Figures 1 and 2*). Electrical loads are mostly typical for a house and include the mechanical equipment, hot tubs, lighting, washers and dryers, convenience receptacles, electric heat lamps and ceiling fans.



Figure 1: Overhead Transformer

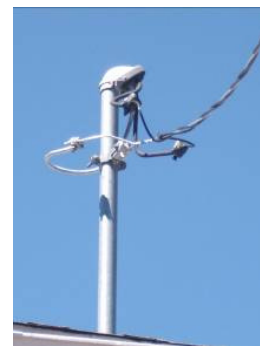


Figure 2: Utility Weatherhead

Interior Spaces

The first floor has two kitchens; each contains a gas range with electric starter, refrigerator, garbage disposal, floor level and above counter receptacles, data connections and lighting.

Also on this floor are three common rooms with lighting and receptacles and a laundry area with two washers and two dryers.

The house has multiple bathrooms and bedrooms. The bedrooms are typical - lights, ceiling fans, receptacles and data connections. The bathrooms are also typical although two of the bathrooms, one on the first floor and one on the second floor, have hot tubs. There is one interior stairwell in the center of the house. It currently has one normally powered light and ceiling fan above the center landing, and one emergency light at the top.

The mechanical equipment is located on both floors. The equipment is a combination of water heaters and fan coil units – an explanation of each piece of equipment is included in the mechanical section of the report. The equipment appears to be primarily gas powered; there were no specific electrical-only heating units noted.

Exterior Spaces

In the back of the building there is a hot tub being served by a 50A disconnect. Entrance doors into the house are each lit with either an incandescent or fluorescent porch light. The drive line is lit by fixtures which are attached to the structure of the building (there are no pole or bollard lights specific to the parking area, see *Figure 3*).



Figure 3: Exterior Lighting

Life Safety Electrical Systems

Existing life safety systems in the house include the emergency light at the stairway and battery powered residential smoke detectors (with audible alarm), located in most rooms of this building (see *Figures 4 and 5*). The smoke detectors are not networked together. There are no visible alarm notification devices (such as strobes).



Figure 4: Emergency Light in Stairwell



Figure 5: Typical Smoke Detector

ELECTRICAL SCOPE OF WORK

There are three main factors leading to renovations of this building. One is to make the first floor ADA compliant, which includes widening doorways and hallways and adding ramps. The second is the requirement, as mandated by the authority having jurisdiction, to change the building occupancy type from R-3 to R-1. This requirement will include upgrades to the life safety system. Finally, the University has some potential programmatic changes which when implemented will better meet the usage requirements desired for the building. The following is a summary of electrical changes which will be required, or recommended, as part of the proposed renovations.

Upgrade of Service Panel

The existing 200A panelboard may be a limiting factor in upgrading the building, although that is unlikely unless significant loads are added (see *Figure 6*). At a minimum, a sub-panel to the existing panel would be recommended to add circuit capacity – it is likely that more circuits will be added during the renovation, and the current panel has no spare circuit space available.



Figure 6: Existing 200A Service Panel

If the mechanical engineer's recommendation is to replace fan coil units with a gas fired furnace, this change will likely reduce the load on the electrical system. This will be offset by the addition of electric range(s) and other additional loads, but overall it appears the service size will be sufficient. However, we have included a line item in the cost estimate section for a new 400A panel – this could be triggered by a significant change to the program as it is currently understood.

Fire Alarm System

A centralized fire alarm system will need to be provided. It will be a zoned system, and will include a new fire alarm control panel capable of operating and supervising new smoke detection devices and alarm notification devices (including strobes). It will have battery backup as mandated by the Code. It will also monitor the flow and tamper switches for the automatic sprinkler system which is anticipated to be added. New smoke detectors will be installed to meet code requirements (hallways, bedrooms, living areas) and visible notification devices will also be added in first floor bedrooms, living spaces and exit pathways.

Life Safety/Egress Systems - Lighting and Signage

Hallways and exit paths will require egress lighting and exit signage, normally supplied from the main service panel and with battery back-up in case of a power outage. Emergency lighting will also need to be provided for the new second level deck and exit stairway to grade (a second exit path from the second floor), in order to ensure a minimum level of illumination to 'the public way'. Directional exit signs are required along the path of egress and at all building exits.

General Lighting and Power Changes

In all areas where the layout of the floor plan will be modified, redesigned lighting will be provided to meet the minimum lighting requirements of a Type R1 Occupancy and per California Title 24. New lighting will be required for the second level deck and outdoor stairs (in addition to the emergency lighting noted above). There will also be corresponding power changes (i.e. receptacles moved/added, fans relocated, etc) – the specific changes depend upon the proposed floor plan. Based on mechanical engineer's recommendations, there will be new or relocated mechanical connections, and likely new locations for the laundry room. All of these changes are combined together in a single line item in the summary.

Relocation of Electrical for ADA Compliance

Beyond the changes based on program need, there will be the ADA mandated changes which the University will implement. The locations/layouts of some First Floor power and data outlets will be relocated or added in some rooms to ensure that adequate numbers of receptacles are a minimum 12" AFF and light switches are at a maximum 48" AFF. If structural renovations are required to widen doorways, several other receptacles and light switches will need to be relocated at the affected locations/rooms – based on the preliminary plans, this occurs in approximately eight places.

SUMMARY OF COST

With the program, function, and ADA upgrade requirements identified at this time, and with our review of the existing conditions, the following is a summary of our estimated opinion of probable costs for the electrical changes which will be required or which have been

recommended, as part of the proposed renovations. Note that these are conceptual only and are not based on an itemized count of receptacles, light switches, lights, etc. to be moved or added. The estimates include material and labor, and the ranges in the costs are partly due to the variability in labor rates, particularly in semi-remote locations like Big Bear. The cost opinion is broken down into line items as follows:

• Upgrade of Service Panel	\$3,500 - \$4,500
• Increase of Service Size to 400A.....	\$9,000 - \$11,000*
• Fire Alarm System	\$4,500 - \$5,500
• Egress Lighting and Signage	\$1,500 - \$2,000
• General Lighting and Power Changes	\$1,500 - \$2,000
• Relocation of Electrical for ADA Compliance	\$1,000 - \$1,500

* This will likely be necessary only if changes to the program for the building are more significant than our understanding.

The total estimated cost for the electrical renovations and upgrades to the property is in the range of \$21,000 to \$26,500. These costs are material and labor only, and do not include any mark up, overhead and profit, taxes, permit fees, and other soft project costs not included in the base labor and materials. We also recommend a 10% contingency be included to the base costs listed above.



PROPOSED CONCEPTUAL SCHEMES

The proposed conceptual schemes incorporate not only the improvements necessary for the building to meet California Building Code, Accessibility and Fire Life Safety Requirements, they also integrate design amenities. Areas of required renovation would also improve building experience for all users.

At the end of this section are the preliminary design schemes for the 1st and 2nd floor plan and site plan, for a total of three pages. Dark dashed lines represent elements of the floor plan to be removed. Existing walls to remain are toned black while black continuous lines are the existing elements to remain. Blue lines represent new work and the new walls are shaded blue. To distinguish between the remodeled and repaired areas of the schemes, the area of remodel is toned in a lighter shade of blue. Noncompliant features outside of the remodel area will be repaired.

It is important to note that though the conceptual schemes are designed in response to deficiencies found during the Fire Life Safety and Accessibility Assessment, the schemes are not intended to be complete and final designs. The schemes are conceived as guidelines for future design and engineering work.

NARRATIVE

In earlier iterations of the conceptual schemes, two options for the plans and two options for the site plan were explored. The final conceptual schemes are hybrids of earlier options, blending required and desirable features from the previous schemes.

Conceptual Plan Scheme

The plan integrates improvements primarily for ADA accessibility code requirements and secondarily for interior circulation, program adjacencies, and connections between rooms, especially to Living Room 102, the main link to the interior accessible path.

In the living room, now overlooking the kitchen, students and visitors will encounter a bar with seating for light meals and socializing. The existing dining room is removed to create a reorganized accessible kitchen with more efficient space use.

In the south part of the house, the existing kitchenette is converted into an accessible bathroom, and the existing bathrooms are relocated and made accessible. One restroom is the accessible bedroom's private bathroom, while the other, where the laundry room existed, is a public toilet room. The entrance to Bedroom 109 is moved to make room for the new accessible bedroom. Two exits from Bedroom 109 and a closet are removed.

The improvements also changed the west part of the house near the sitting room. The HVAC becomes fully enclosed by walls, and the room is relocated. The laundry room is moved to an existing hallway. The relocation creates accessibility to the laundry room and opens up the view from the sitting room to the back patio.

2nd FLOOR:

The doors to each of the bedrooms are widened to a 36" width, giving each opening the 32" clear space required. The closets of the east bedrooms are removed and Hallway 202 widened to accommodate new doors. Simply replacing doors 23 and 25 with wider ones within the existing walls would have not complied with codes. Door number 16 is a simple replacement, while Door 20 is replaced and relocated to the end of the hallway, directly into Bedroom 209.

An emergency exit door replaces the existing HVAC room, and leads out onto a new exit deck. A stair running north-south leads the occupants down to the patio below.

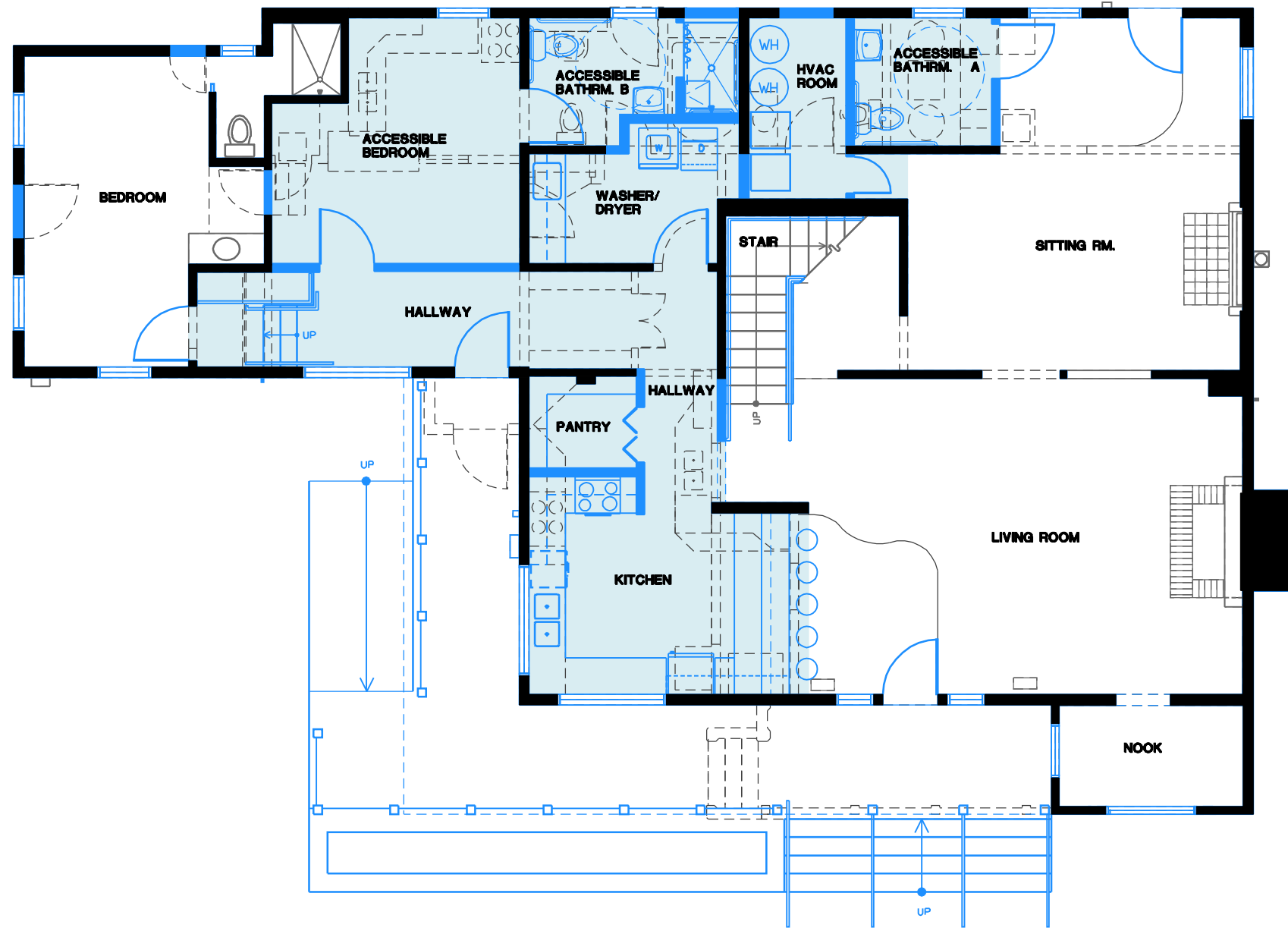
Conceptual Site Scheme

The site scheme is shaped mainly by the interior plan improvements, but also by a winnowed list of amenities suggested by the client.




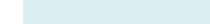
General parking is pulled away from the east façade and provides a turnabout for larger sized vehicles or vehicles hitched to equipment. The relocated general parking also provides room for an accessible parking space and a ramp near the front entrance. The ramp starts at a higher elevation near the south end of the building so that only a short ramp is needed. At the enlarged and covered wraparound front porch, a wide stair marks the entrance to the house. The porch links the two front entrances and makes them both accessible.

The back yard includes hardscape and programmed but not designed landscape. From the sitting room, students can walk out to an enclosed screened patio, partially covered by the second floor deck. Branching off from the patio are various places for social activities: a BBQ and a picnic area, a sunken conversation pit with amphitheatre seating and a lower patio where students can set up game tables.

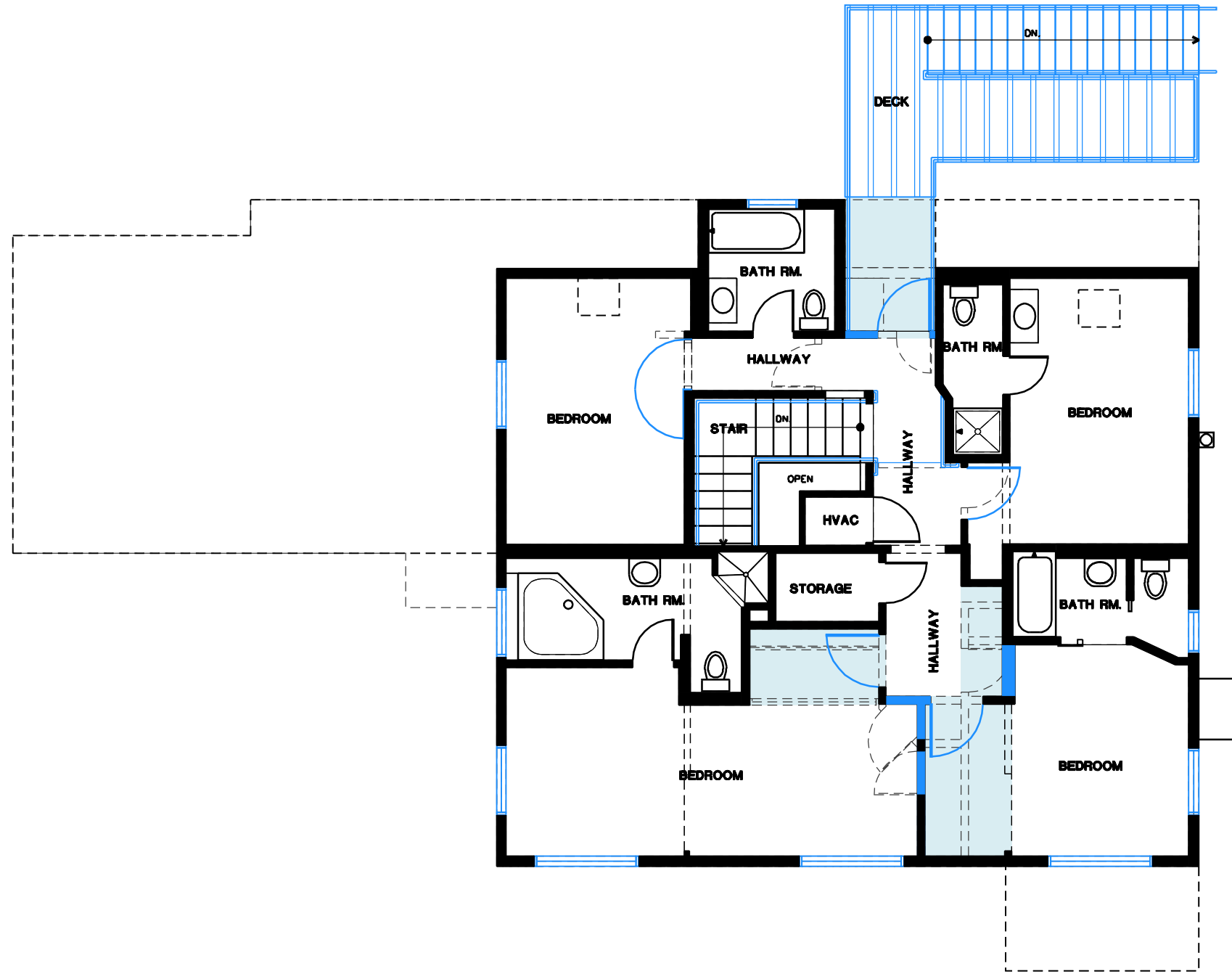
The landscape, not included in the cost estimates, is imagined as contemplative place for the students, where they can meander on winding paths to a rock garden and around a reflecting pool. The concourse is a building up of the land with berms and dips in the landscape so that students have places to lean or lie against in the fall and spring, or to use as cover during snow fights during the winter. The shrubs and trees are placed so they either screen activity or guide movement through the site.







KEY LEGEND

-  EXISTING TO BE REMOVED
-  EXISTING WALLS TO REMAIN
-  NEW WORK
-  REMODEL AREA

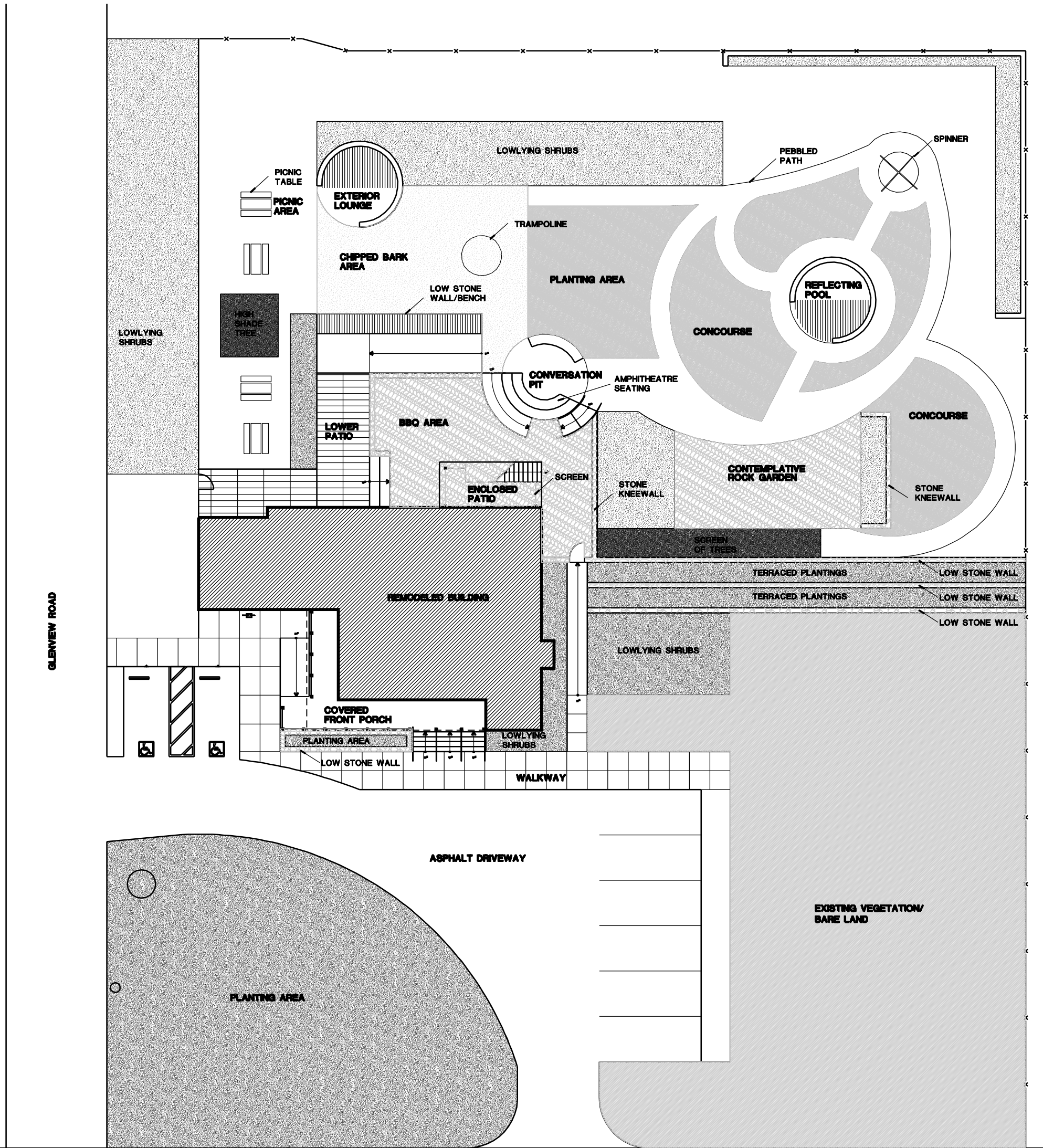




KEY LEGEND

-  EXISTING TO BE REMOVED
-  EXISTING WALLS TO REMAIN
-  NEW WORK
-  REMODEL AREA





EDGEMOOR ROAD



PRELIMINARY CONSTRUCTION COST ESTIMATES

The costs related to the suggested work must be considered approximate. Future detailed architectural and engineering and related cost analyses, which are necessary to confirm the conclusions reached in this report, may indicate that a lesser or greater degree of renovation is warranted. Consequently, the architects and engineers designing the work may utilize alternative concepts.

The site improvements include only the hardscape. In the front, the site improvements include the asphalt driveway, the walkway and the porch. In the backyard, the site improvements include all of the paved areas, the enclosed patio, the BBQ area, the conversation pit and the lower patio. The 2nd floor deck is considered to be part of the 2nd floor fire life safety upgrades, to meet the requirement for a second exit.

Landscaping is outside the scope of this cost estimate. All exterior features other than hardscape such as lowlying shrubs, trees, planting areas, terraced plantings, the rock garden, the reflecting pool, the exterior lounge, the chipped bark area and the picnic area are all considered to be part of the landscaping.

UPGRADE/REMODEL		
1	ARCHITECTURAL	
	FIRE LIFE SAFETY	
	Upgrade/Repair	\$83,900 – \$102,500
	ADA ACCESSIBILITY	
	Site Improvements (Hardscape only, no landscape)	
	Demolition	\$11,900 – \$16,000
	Asphalt Driveway	\$6,200 – \$7,500
	Walkway	\$7,800 – \$9,400
	Porch	\$15,700 – \$18,900
	Enclosed patio, BBQ area, conversation pit, ramp, lower patio, and misc. site improvements	\$31,700 – \$38,000

	Interior Upgrades	
	1 st Floor Remodel – Designated Area	\$33,000 – \$41,000
	Kitchen Remodel	\$25,000 – \$31,000
	Bathroom (A) Remodel	\$15,000 – \$18,000
	Bathroom (B) Remodel	\$26,000 – \$32,000
	1 st Floor Misc. Patch and Repair Finishes Outside Remodel Area	\$10,400 – \$13,000
	2 nd Floor Remodel – Designated Area	\$8,000 – \$10,000
	2 nd Floor Misc. Patch and Repair Finishes Outside Remodel Area	\$10,300 – \$12,900

The subtotal for the engineering consultant work is a sum of the less expensive options, the worst case scenario. The figure gives the University of California, Riverside a rough estimate of the upper limits of the renovation costs and the flexibility to choose the less expensive options in the future.

		SUBTOTAL	\$284,900 – \$350,200
2	STRUCTURAL		\$30,000 – \$34,000
		SUBTOTAL	\$30,000 – \$34,000
3	MECHANICAL		
		Option 1: Increase capacity	\$18,500
		Option 2: Separate systems	\$22,500
		Automatic sprinkler system	\$23,000 – \$27,000
		SUBTOTAL	\$45,500 – \$49,500
4	PLUMBING		
		Option 1: Three water heaters	\$73,600
		Option 2: One water heater	\$62,600
		SUBTOTAL	\$73,600
5	ELECTRICAL		\$16,500 – \$21,000
		Fire alarm system	\$4,500 – \$5,500
		SUBTOTAL	\$21,000 – \$26,500
		TOTAL	\$455,000 - \$533,800
		AVERAGE COST PER SQUARE FOOT	\$126.25 - \$148.11



For comparison, the preliminary construction cost estimates for new construction are provided at the bottom of this page. The figures, representing current construction costs of the project still in conceptual stages when details were unavailable, are only to be used as a starting point for the budgeting process. The range allows the future project architect and engineers some design freedom to experiment with a building of larger than average volume and type of construction other than customary light framing.

The costs are for the construction of a new building of the same size and occupancy. The figures, derived from a nationwide database, with tremendous variation in size, complexity and owner's requirements, are adjusted to reflect the project locality and the anticipated better-than-average institutional grade and quality of work.

Cost per square foot generally is calculated from the building size only, and does not include site work. However, in this case, in order to provide a better cost comparison between renovation and new construction, and to show a fuller picture of the overall scope of the project, the costs for demolition and site are also added to the calculations.

NEW CONSTRUCTION	
Demolition (no salvage)	\$19,000 – \$23,000
New Building (Same Size)	\$630,000 – \$757,000
Site Work/Hardscape	\$50,000 – \$60,000
TOTAL	
	\$699,000 - \$840,000
AVERAGE COST PER SQUARE FOOT	
	\$193.95 - \$233.07

