Summary SECTION 01

The project includes renovations, repairs and alterations to improve the function and seismic resistance of a single story, wood framed residence with an attached car port and under-house storage space. The work did not change the building foot print.

Alterations include remodeling the kitchen, bathroom and living room; adding a new bathroom and exterior laundry enclosure. Renovations include installing a retaining wall, sidewalk and exterior hand-rail; replacing the carport foundations and driveway; and seismically strengthening the carport framing and residence foundation walls.

Project Data [Table: 0101.01]

Type	No./Date	Name	Address	Zip
Client	C001	Bryna Holland	15 Blanca Drive, Novato	94947
Project	P010	Residence Remodel	55 Loring Avenue, Mill Valley	94941
Drawings	Dec. 1 , 2020	PR-01 to PR-11	55 Loring Avenue, Mill Valley	94941

Background SECTION 02

The structural calculations address remodeling, repair and strengthening of a single family residence.

The single family residence dates to the 1940’s and was built on two combined lots with an average grade of about 1 in 6. It has a reinforced concrete strip foundation, under house storage, plywood sheathed perimeter walls, and a flat T&G plank roof (under an original tar and gravel membrane overlaid with foam) supported by interior posts and beams. The car port structure is also a post and beam structure with roof planks.

During the prior decades the carport posts had significantly decayed below the slab line, leading to uneven carport roof settlement up to 6 inches. In addition surface sliding had piled soil up to a foot deep causing the lower part of the siding to decay. Decayed portions were removed and replaced and a planter/retaining structure was designed to retain the sliding and prevent further decay.

The residence foundation was seismically vulnerable. Two sides of the floor diaphragm were directly supported on the strip foundation but the other two sides were supported on stud walls up to 6 feet tall. The framed foundation walls had very little in-plane strength which made the entire structure vulnerable to earthquake damage from first floor twisting. Each of the two framed walls had a single minimal compression brace that could not prevent seismic translation. Four new shear walls were added.

In summary, over the course of the last five years work was done to mitigate safety hazards including seismic vulnerabilities and wood decay, and improve living spaces.

Project Areas [Table: 0101.02]

Description	Value	Unit
residence area	1000	SQF
car port area	400	SQF
storage area	100	SQF

Residence viewed from Loring Drive [Fig: 0101.01]

Building Codes and Site SECTION 03

The residence is under the jurisdiction of Marin County, California which uses the 2019 California Building Code and the 2019 California Residential Code to permit construction work.

CBC 2019 - Structural Reference Standards [Table: 0101.03]

Category	Standard	Year
Loading	ASCE-7	2016
Concrete	ACI-318	2014
Wood-National Design Specifications	AWC-NDS	2018
Wood-Special Design Provisions for Wind and Seismic	AWC-SDPWS	2015
Wood Frame Construction Manual	AWC-WFCM	2018

Site map - Marin County web site [Fig: 0101.02]

Site map - Google Earth [Fig: 0101.03]

Drawing List **SECTION 04**

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55 LORING - RESIDENCE REMODEL AND SEISMIC STRENGTHENING

PR.01: COVER AND INDEX
PR.02: PROJECT SCOPE
PR.03: GENERAL NOTES, CONTRACTORS
PR.04: SITE PLAN
PR.05: PLANS
PR.06: ELEVATIONS
PR.07: KITCHEN AND BATH REMODEL
PR.08: MASTER BATH, CLOSET, LAUNDRY
PR.09: RESIDENCE STRENGTHENING
PR.10: CARPORT STRENGTHENING
PR.11: SITE IMPROVEMENTS
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Residence and Carport [Fig: 0101.04]

References **SECTION 05**

ACI
American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331
318â€”14

AISC
American Institute of Steel
130 East Randolph Street, Suite 2000
Chicago, IL 60601-6219
ANSI/AISC 341â€”16
Seismic Provisions for Structural Steel Buildings

AISI
American Iron and Steel Institute
25 Massachusetts Avenue, NW Suite 800
Washington, DC 20001
AISI S100â€”16
North American Specification for the Design of Cold-formed
Steel Structural Members, 2016

ASCE/SEI
American Society of Civil Engineers
Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191-4400
7â€”16 Minimum Design Loads and Associated Criteria for
Buildings and Other Structures with Supplement No. 1

AWC
American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175
ANSI/AWC NDSâ€”2018
National Design Specification (NDS) for
Wood Constructionâ€”with 2018 NDS Supplement
ANSI/AWC SDPWSâ€”2015
Special Design Provisions for Wind and Seismic

CBC
International Code Council
500 New Jersey Avenue, NW
6th Floor, Washington, DC 20001
California Building Standards Commission
2525 Natomas Park Dr # 130, Sacramento, CA 95833
California Building Code

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Part 2 of Title 24, 2019 Edition

CRC
International Code Council
500 New Jersey Avenue, NW
6th Floor, Washington, DC 20001
California Building Standards Commission
2525 Natomas Park Dr # 130, Sacramento, CA 95833
California Residential Code
Part 2.5 of Title 24, 2019 Edition
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Math and Text Abbreviations **SECTION 06**

Math

$\mathrm{D}=$ dead load
$\mathrm{DL}=$ dead load
$\mathrm{L}=$ live load
$\mathrm{LL}=$ live load
$\mathrm{E}=$ earthquake load
$\mathrm{F_a}=$ acceleration site coefficient
$\mathrm{F_v}=$ velocity site coefficient
$\mathrm{F_N}=$ normal wind force
$\mathrm{GC_{Ms}}=$ net moment static coefficient
$\mathrm{GC_{Md}}=$ net moment dynamic coefficient
$\mathrm{GC_M}=$ net moment coefficient
$\mathrm{GC_P}=$ net pressure coefficient
$\mathrm{k_{\mathbf{1}}}=$ hazard coefficient
$\mathrm{k_{\mathbf{2}}}=$ terrain and structure coefficient
$\mathrm{k_{\mathbf{3}}}=$ topography coefficient
$\mathrm{Kzt}=$ topographic Factor
$\mathrm{K_z}=$ velocity pressure exposure coefficient
$\mathrm{MRI}=$ mean return interval
$\mathrm{p_d}=$ net design wind pressure on module - Pa
$\mathrm{SDOF}=$ single degree of freedom
$\mathrm{S_s}=$ short period mapped acceleration
$\mathrm{S_{DS}}=$ site design response acceleration
$\mathrm{S_{\mathbf{1}}}=$ 1 second period mapped acceleration
$\mathrm{S_{MS}}=$ short period parameter
$\mathrm{S_{M\mathbf{1}}}=$ 1 second period parameter
$\mathrm{T}=$ fundamental period of structure
$\mathrm{T_{\mathbf{0}}}=$ short period spectral cap
$\mathrm{T_S}=$ long period spectral cap
$\mathrm{V_b}=$ basic wind speed
$\mathrm{V_B}=$ seismic design base shear
$\mathrm{W}=$ wind load
$\mathrm{W}=$ seismic weight of structure

Text

ASD	Allowable Stress Design
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AB	Anchor Bolt
BDRY	Boundry
CBC	Califiornia Building Code
CRC	Califiornia Residential Code
CIP	Cast-In-Place
CLR	Clear
CONC	Concrete
CMU	Concrete Masonry Unit
CRSI	Concrete Reinforcing Steel Institute
CONST JT	Construction Joint
CONT	Continuous
CJ	Control Joint
D-C	Demand-Capacity (ratio)
DIA	Diameter
DIM	Dimension
EA	Each
EF	Each Face
EJ	Expansion Joint
ES	Each Side
EW	Each Way
EXP Bolt	Expansion Bolt
EXP JT	Expansion Joint
FTG	Footing
FND	Foundation
GALV	Galvanized
GA	Gauge
GR	Grade
HT	Height
IN	Inch
ID	Inside Diameter
ICBO	International Conference of Building Officials
K	Kip (1000 Pounds)
LWC	Light Weight Concrete
LRFD	Load and Resistance Factor Design
NWC	Normal Weight Concrete
NIC	Not in Contract
OC	On Center
OD	Outside Diameter
OPNG	Opening

PVC	Polyvinyl Chloride
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
R	Radius
REINF	Reinforced
SIM	Similar
SOG	Slab on Grade
SL	Splice Length
SQ	Square
STD	Standard
SDI	Steel Deck Institute
SF	Step Footing or Square Foot
SYM	Symmetrical
THK	Thick or Thickness
T & B	Top and Bottom
T & G	Tongue and Groove
TOC	Top of Concrete
TOF	Top of Foundation
TOS	Top of Steel
TOW	Top of Wall
TYP	Typical
UNO	Unless Noted Otherwise
WWF	Welded Wire Fabric
W/	With
WP	Working Point