



Department of the Interior
National Park Service
Yellowstone National Park

HISTORIC STRUCTURES REPORT

for

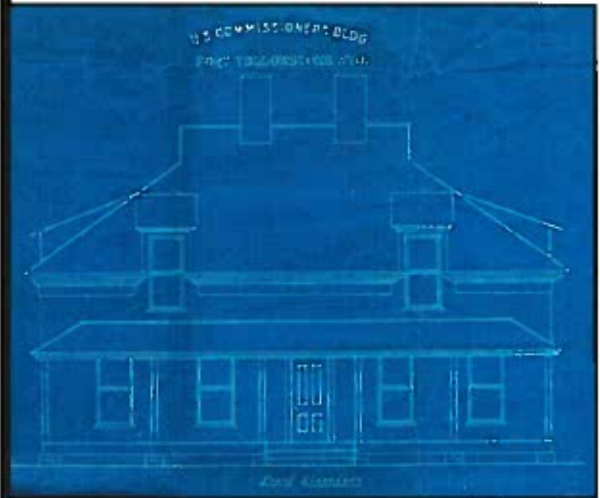
U.S. COMMISSIONER'S HOUSE

Mammoth, Yellowstone National Park

April 2011

Prepared by Sievert & Sievert CRC
in conjunction with Montana Preservation Alliance

Historic Documentation & Project Review provided by National
Park Service



CONTENTS

EXECUTIVE SUMMARY

Directive	1
Methodology	1
Administrative History	2
Major Findings	4
Recommendations	5

PART 1. DEVELOPMENTAL HISTORY

Narrative History & Historic Significance	7
Archaeological Considerations	17
Historic Photographs & Plans	18
Physical Description Condition Assessment	30
Exterior	31
Interior	33
Materials Inventory	36
Current Photographs	55

PART 2. TREATMENT AND USE

Requirements	101
Building Code Criteria	101

Building Code Flowchart	103
Building Code Analysis	104
Structural Considerations	107
ADA Considerations	110
Recommended Alternatives Priority and Suggested Actions	112
Preservation Plan: Residence	114
Preservation Plan: Carriage House	126

PART 3. RECORD OF TREATMENT

Preservation Treatment and Recommendations Completion Report	129
Technical Data	129

APPENDICES

A. Measured Drawings	130
B. Seismic Evaluation	143
C. ADA Considerations	157
D. Personnel	159
E. Bibliography	160
F. Structural Analysis	162
G. Misc. Historic Plans	170

Contents

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. OBJECTIVES	2
3. SCOPE	3
4. METHODOLOGY	4
5. RESULTS	5
6. CONCLUSIONS	6
7. RECOMMENDATIONS	7
8. REFERENCES	8
9. APPENDICES	9
10. GLOSSARY	10
11. INDEX	11
12. LIST OF FIGURES	12
13. LIST OF TABLES	13
14. ABBREVIATIONS	14
15. ACKNOWLEDGEMENTS	15
16. EXECUTIVE SUMMARY	16
17. INTRODUCTION	17
18. OBJECTIVES	18
19. SCOPE	19
20. METHODOLOGY	20
21. RESULTS	21
22. CONCLUSIONS	22
23. RECOMMENDATIONS	23
24. REFERENCES	24
25. APPENDICES	25
26. GLOSSARY	26
27. INDEX	27
28. LIST OF FIGURES	28
29. LIST OF TABLES	29
30. ABBREVIATIONS	30
31. ACKNOWLEDGEMENTS	31
32. EXECUTIVE SUMMARY	32
33. INTRODUCTION	33
34. OBJECTIVES	34
35. SCOPE	35
36. METHODOLOGY	36
37. RESULTS	37
38. CONCLUSIONS	38
39. RECOMMENDATIONS	39
40. REFERENCES	40
41. APPENDICES	41
42. GLOSSARY	42
43. INDEX	43
44. LIST OF FIGURES	44
45. LIST OF TABLES	45
46. ABBREVIATIONS	46
47. ACKNOWLEDGEMENTS	47
48. EXECUTIVE SUMMARY	48
49. INTRODUCTION	49
50. OBJECTIVES	50
51. SCOPE	51
52. METHODOLOGY	52
53. RESULTS	53
54. CONCLUSIONS	54
55. RECOMMENDATIONS	55
56. REFERENCES	56
57. APPENDICES	57
58. GLOSSARY	58
59. INDEX	59
60. LIST OF FIGURES	60
61. LIST OF TABLES	61
62. ABBREVIATIONS	62
63. ACKNOWLEDGEMENTS	63
64. EXECUTIVE SUMMARY	64
65. INTRODUCTION	65
66. OBJECTIVES	66
67. SCOPE	67
68. METHODOLOGY	68
69. RESULTS	69
70. CONCLUSIONS	70
71. RECOMMENDATIONS	71
72. REFERENCES	72
73. APPENDICES	73
74. GLOSSARY	74
75. INDEX	75
76. LIST OF FIGURES	76
77. LIST OF TABLES	77
78. ABBREVIATIONS	78
79. ACKNOWLEDGEMENTS	79
80. EXECUTIVE SUMMARY	80
81. INTRODUCTION	81
82. OBJECTIVES	82
83. SCOPE	83
84. METHODOLOGY	84
85. RESULTS	85
86. CONCLUSIONS	86
87. RECOMMENDATIONS	87
88. REFERENCES	88
89. APPENDICES	89
90. GLOSSARY	90
91. INDEX	91
92. LIST OF FIGURES	92
93. LIST OF TABLES	93
94. ABBREVIATIONS	94
95. ACKNOWLEDGEMENTS	95
96. EXECUTIVE SUMMARY	96
97. INTRODUCTION	97
98. OBJECTIVES	98
99. SCOPE	99
100. METHODOLOGY	100
101. RESULTS	101
102. CONCLUSIONS	102
103. RECOMMENDATIONS	103
104. REFERENCES	104
105. APPENDICES	105
106. GLOSSARY	106
107. INDEX	107
108. LIST OF FIGURES	108
109. LIST OF TABLES	109
110. ABBREVIATIONS	110
111. ACKNOWLEDGEMENTS	111
112. EXECUTIVE SUMMARY	112
113. INTRODUCTION	113
114. OBJECTIVES	114
115. SCOPE	115
116. METHODOLOGY	116
117. RESULTS	117
118. CONCLUSIONS	118
119. RECOMMENDATIONS	119
120. REFERENCES	120
121. APPENDICES	121
122. GLOSSARY	122
123. INDEX	123
124. LIST OF FIGURES	124
125. LIST OF TABLES	125
126. ABBREVIATIONS	126
127. ACKNOWLEDGEMENTS	127
128. EXECUTIVE SUMMARY	128
129. INTRODUCTION	129
130. OBJECTIVES	130
131. SCOPE	131
132. METHODOLOGY	132
133. RESULTS	133
134. CONCLUSIONS	134
135. RECOMMENDATIONS	135
136. REFERENCES	136
137. APPENDICES	137
138. GLOSSARY	138
139. INDEX	139
140. LIST OF FIGURES	140
141. LIST OF TABLES	141
142. ABBREVIATIONS	142
143. ACKNOWLEDGEMENTS	143
144. EXECUTIVE SUMMARY	144
145. INTRODUCTION	145
146. OBJECTIVES	146
147. SCOPE	147
148. METHODOLOGY	148
149. RESULTS	149
150. CONCLUSIONS	150
151. RECOMMENDATIONS	151
152. REFERENCES	152
153. APPENDICES	153
154. GLOSSARY	154
155. INDEX	155
156. LIST OF FIGURES	156
157. LIST OF TABLES	157
158. ABBREVIATIONS	158
159. ACKNOWLEDGEMENTS	159
160. EXECUTIVE SUMMARY	160
161. INTRODUCTION	161
162. OBJECTIVES	162
163. SCOPE	163
164. METHODOLOGY	164
165. RESULTS	165
166. CONCLUSIONS	166
167. RECOMMENDATIONS	167
168. REFERENCES	168
169. APPENDICES	169
170. GLOSSARY	170
171. INDEX	171
172. LIST OF FIGURES	172
173. LIST OF TABLES	173
174. ABBREVIATIONS	174
175. ACKNOWLEDGEMENTS	175
176. EXECUTIVE SUMMARY	176
177. INTRODUCTION	177
178. OBJECTIVES	178
179. SCOPE	179
180. METHODOLOGY	180
181. RESULTS	181
182. CONCLUSIONS	182
183. RECOMMENDATIONS	183
184. REFERENCES	184
185. APPENDICES	185
186. GLOSSARY	186
187. INDEX	187
188. LIST OF FIGURES	188
189. LIST OF TABLES	189
190. ABBREVIATIONS	190
191. ACKNOWLEDGEMENTS	191
192. EXECUTIVE SUMMARY	192
193. INTRODUCTION	193
194. OBJECTIVES	194
195. SCOPE	195
196. METHODOLOGY	196
197. RESULTS	197
198. CONCLUSIONS	198
199. RECOMMENDATIONS	199
200. REFERENCES	200
201. APPENDICES	201
202. GLOSSARY	202
203. INDEX	203
204. LIST OF FIGURES	204
205. LIST OF TABLES	205
206. ABBREVIATIONS	206
207. ACKNOWLEDGEMENTS	207
208. EXECUTIVE SUMMARY	208
209. INTRODUCTION	209
210. OBJECTIVES	210
211. SCOPE	211
212. METHODOLOGY	212
213. RESULTS	213
214. CONCLUSIONS	214
215. RECOMMENDATIONS	215
216. REFERENCES	216
217. APPENDICES	217
218. GLOSSARY	218
219. INDEX	219
220. LIST OF FIGURES	220
221. LIST OF TABLES	221
222. ABBREVIATIONS	222
223. ACKNOWLEDGEMENTS	223
224. EXECUTIVE SUMMARY	224
225. INTRODUCTION	225
226. OBJECTIVES	226
227. SCOPE	227
228. METHODOLOGY	228
229. RESULTS	229
230. CONCLUSIONS	230
231. RECOMMENDATIONS	231
232. REFERENCES	232
233. APPENDICES	233
234. GLOSSARY	234
235. INDEX	235
236. LIST OF FIGURES	236
237. LIST OF TABLES	237
238. ABBREVIATIONS	238
239. ACKNOWLEDGEMENTS	239
240. EXECUTIVE SUMMARY	240
241. INTRODUCTION	241
242. OBJECTIVES	242
243. SCOPE	243
244. METHODOLOGY	244
245. RESULTS	245
246. CONCLUSIONS	246
247. RECOMMENDATIONS	247
248. REFERENCES	248
249. APPENDICES	249
250. GLOSSARY	250
251. INDEX	251
252. LIST OF FIGURES	252
253. LIST OF TABLES	253
254. ABBREVIATIONS	254
255. ACKNOWLEDGEMENTS	255
256. EXECUTIVE SUMMARY	256
257. INTRODUCTION	257
258. OBJECTIVES	258
259. SCOPE	259
260. METHODOLOGY	260
261. RESULTS	261
262. CONCLUSIONS	262
263. RECOMMENDATIONS	263
264. REFERENCES	264
265. APPENDICES	265
266. GLOSSARY	266
267. INDEX	267
268. LIST OF FIGURES	268
269. LIST OF TABLES	269
270. ABBREVIATIONS	270
271. ACKNOWLEDGEMENTS	271
272. EXECUTIVE SUMMARY	272
273. INTRODUCTION	273
274. OBJECTIVES	274
275. SCOPE	275
276. METHODOLOGY	276
277. RESULTS	277
278. CONCLUSIONS	278
279. RECOMMENDATIONS	279
280. REFERENCES	280
281. APPENDICES	281
282. GLOSSARY	282
283. INDEX	283
284. LIST OF FIGURES	284
285. LIST OF TABLES	285
286. ABBREVIATIONS	286
287. ACKNOWLEDGEMENTS	287
288. EXECUTIVE SUMMARY	288
289. INTRODUCTION	289
290. OBJECTIVES	290
291. SCOPE	291
292. METHODOLOGY	292
293. RESULTS	293
294. CONCLUSIONS	294
295. RECOMMENDATIONS	295
296. REFERENCES	296
297. APPENDICES	297
298. GLOSSARY	298
299. INDEX	299
300. LIST OF FIGURES	300
301. LIST OF TABLES	301
302. ABBREVIATIONS	302
303. ACKNOWLEDGEMENTS	303
304. EXECUTIVE SUMMARY	304
305. INTRODUCTION	305
306. OBJECTIVES	306
307. SCOPE	307
308. METHODOLOGY	308
309. RESULTS	309
310. CONCLUSIONS	310
311. RECOMMENDATIONS	311
312. REFERENCES	312
313. APPENDICES	313
314. GLOSSARY	314
315. INDEX	315
316. LIST OF FIGURES	316
317. LIST OF TABLES	317
318. ABBREVIATIONS	318
319. ACKNOWLEDGEMENTS	319
320. EXECUTIVE SUMMARY	320
321. INTRODUCTION	321
322. OBJECTIVES	322
323. SCOPE	323
324. METHODOLOGY	324
325. RESULTS	325
326. CONCLUSIONS	326
327. RECOMMENDATIONS	327
328. REFERENCES	328
329. APPENDICES	329
330. GLOSSARY	330
331. INDEX	331
332. LIST OF FIGURES	332
333. LIST OF TABLES	333
334. ABBREVIATIONS	334
335. ACKNOWLEDGEMENTS	335
336. EXECUTIVE SUMMARY	336
337. INTRODUCTION	337
338. OBJECTIVES	338
339. SCOPE	339
340. METHODOLOGY	340
341. RESULTS	341
342. CONCLUSIONS	342
343. RECOMMENDATIONS	343
344. REFERENCES	344
345. APPENDICES	345
346. GLOSSARY	346
347. INDEX	347
348. LIST OF FIGURES	348
349. LIST OF TABLES	349
350. ABBREVIATIONS	350
351. ACKNOWLEDGEMENTS	351
352. EXECUTIVE SUMMARY	352
353. INTRODUCTION	353
354. OBJECTIVES	354
355. SCOPE	355
356. METHODOLOGY	356
357. RESULTS	357
358. CONCLUSIONS	358
359. RECOMMENDATIONS	359
360. REFERENCES	360
361. APPENDICES	361
362. GLOSSARY	362
363. INDEX	363
364. LIST OF FIGURES	364
365. LIST OF TABLES	365
366. ABBREVIATIONS	366
367. ACKNOWLEDGEMENTS	367
368. EXECUTIVE SUMMARY	368
369. INTRODUCTION	369
370. OBJECTIVES	370
371. SCOPE	371
372. METHODOLOGY	372
373. RESULTS	373
374. CONCLUSIONS	374
375. RECOMMENDATIONS	375
376. REFERENCES	376
377. APPENDICES	377
378. GLOSSARY	378
379. INDEX	379
380. LIST OF FIGURES	380
381. LIST OF TABLES	381
382. ABBREVIATIONS	382
383. ACKNOWLEDGEMENTS	383
384. EXECUTIVE SUMMARY	384
385. INTRODUCTION	385
386. OBJECTIVES	386
387. SCOPE	387
388. METHODOLOGY	388
389. RESULTS	389
390. CONCLUSIONS	390
391. RECOMMENDATIONS	391
392. REFERENCES	392
393. APPENDICES	393
394. GLOSSARY	394
395. INDEX	395
396. LIST OF FIGURES	396
397. LIST OF TABLES	397
398. ABBREVIATIONS	398
399. ACKNOWLEDGEMENTS	399
400. EXECUTIVE SUMMARY	400
401. INTRODUCTION	401
402. OBJECTIVES	402
403. SCOPE	403
404. METHODOLOGY	404
405. RESULTS	405
406. CONCLUSIONS	406
407. RECOMMENDATIONS	407
408. REFERENCES	408
409. APPENDICES	409
410. GLOSSARY	410
411. INDEX	411
412. LIST OF FIGURES	412
413. LIST OF TABLES	413
414. ABBREVIATIONS	414
415. ACKNOWLEDGEMENTS	415
416. EXECUTIVE SUMMARY	416
417. INTRODUCTION	417
418. OBJECTIVES	418
419. SCOPE	419
420. METHODOLOGY	420
421. RESULTS	421
422. CONCLUSIONS	422
423. RECOMMENDATIONS	423
424. REFERENCES	424
425. APPENDICES	425
426. GLOSSARY	426
427. INDEX	427
428. LIST OF FIGURES	428
429. LIST OF TABLES	429
430. ABBREVIATIONS	430
431. ACKNOWLEDGEMENTS	431
432. EXECUTIVE SUMMARY	432

EXECUTIVE SUMMARY

DIRECTIVE

This report was prepared under Cooperative Agreement H1233E007, by which the National Park Service [NPS] and Montana Preservation Alliance [MPA] will work closely to strategically plan for management and preservation of highly significant buildings within the boundaries of Yellowstone National Park [YNP]. Under the agreement's task order, this project will define recommended treatments to be used as part of an overall strategic plan to enhance Yellowstone's historic structures associated with the core operations of the park, combined with visitor services and visitor understanding and education of the cultural development of the park's historic built environment.

During the first phase of this agreement, MPA and YNP staff have begun preparation of a series of Historic Structures reports on historically and architecturally-significant buildings within the park. Professional and technical services for this first phase were provided by Sievert & Sievert CRC, consultants in the fields of Historic Architecture, Architecture and Structural Design.

This Historic Structures Report [HSR] on the U.S. Commissioner's Residence is intended to provide a detailed cultural and technical evaluation of the building, to identify and prioritize the deficiencies that exist for the structure, and to derive a plan to stabilize and preserve the building for future generations and for continued use. To accomplish these goals, this report includes a statement of the historic significance of the property, a narrative history of the U.S. Commissioner's Residence, a condition assessment of all materials, an assessment of which materials are original, and a preservation plan that outlines care of those materials based on their originality and condition.

METHODOLOGY

The following research and documentary actions were initiated in the course of reviewing the existing condition of the property:

A. Visual on-site observations were made during several trips to the site during 2006 / 2007. The observations were limited to what could be seen with minimal disturbance to the structure.

B. The facility was photographed during the trips as noted above. Many of those photos are contained within the body of this report.

C. Limited design drawings and drawings for proposed modifications to the building were found on ETIC; drawings contained in this report are from a combination of those design drawings and field measurements taken during site visits as noted above.

D. All materials were assessed on site in regard to condition. The assessment methods and conclusions are reported on in the Evaluation / Assessment section of this report.

E. Limited structural evaluations were completed during the preparation of this report. Selected structural "safety checks" were made on typical structural framing members.

F. A building code "overview" is incorporated with this report; specifically to consider code related implications of permitting continued use of the building. Accessibility guidelines were included with the building code evaluation as they apply to the building.

G. Historic architectural and engineering methods and practices were reviewed and evaluated as they pertain to the construction of this building.

H. As further explained in the Evaluation/Assessment text, in-depth Mechanical and Electrical evaluations were specifically excluded from this report.

I. Existing YNP planning and National Register documents were reviewed, historic contextual information was provided by park cultural resources personnel, and additional secondary sources were consulted to supplement existing knowledge regarding the U.S. Commissioner's House and its broader significance.

ADMINISTRATIVE DATA

The U.S. Commissioner's Residence is a contributing building in the southwest corner of the Fort Yellowstone/ Mammoth Hot Springs Historic District National Historic Landmark. As a contributor within the NHL, it is a **Historic Property of National Significance**, listed with the district in 2003.

Constructed in 1894, the U.S. Commissioner's Residence reflects the necessity to provide security and law enforcement within the nation's first national park. The history of this property demonstrates the changing role and responsibilities of park rangers and managers over the historic period. From almost the very beginning of the park's history in 1872, park administrators wrestled with the challenge of effectively policing the park and protecting its unique resources. Construction of the U.S. Commissioner's Residence and Jail in 1894 was a direct response to these pressures, and the building has been in continual use as the residence of the U.S. Commissioner ever since. Currently, the U.S. Commissioner's Residence provides housing to the acting Magistrate and his family while serving as a reminder of the NPS ongoing commitment to preserving its first park and to ensuring the safety of visitors.

Designed by Fisk J. Shaffer, the commissioner's residence was the first stone building constructed in the Fort Yellowstone district, a "typical late nineteenth century military fort within the boundaries of Yellowstone National Park..."¹ Its construction signaled a new era of building in the park, as park development matured and took on more permanence. Blocky and symmetrical, with an ashlar sandstone first story, dormered gable on hip roof structure and full-width open porch, the residence captured key architectural elements of military garrisons and forts of the late 19th century, and is certainly an integral part of the Fort Yellowstone architectural patterning. In fact, its design may well have influenced the stone buildings that followed there beginning in 1909.

Pertinent classification data is as follows:

- Locational references: Building Number 49
- National Register Status: Listed July 31, 2003 as a Contributing Property in the Fort Yellowstone Historic District National Historic Landmark.
- Category of Significance: Category 1b: *Structures that contribute to the national significance of a historic district.* The U.S. Commissioner's Residence is listed as a contributing building within the Fort Yellowstone/Mammoth Hot Springs Historic District NHL. This National Historic Landmark is significant on a national level under Criterion 1 *for its association with the military administration of Yellowstone National Park and for the impact the principles and policies developed during the military administration of Yellowstone had on the emerging conservation and national park movements in the United States in the late nineteenth and early twentieth centuries.*² Specifically, the commissioner's residence had a role in developing principles and policies toward conservation and national park stewardship during the time that the U.S. Army

administered Yellowstone National Park. Such early management decisions and directives set a significant precedent at the founding of the National Park Service and were embraced by multiple generations of federal officials in the years that followed.

- **Period of Significance:** 1894 (date of construction) – 1918 (end date for period of significance listed in the original Fort Yellowstone National Register submission. While the jail served only for a brief period, if at all, the building has continued to serve as a residence for the U.S. Commissioner up to the present. Thus, the function of the building is little altered from the time of its construction, and the period of significance for this structure holds.
- **Significant Historic Contexts:** Architecture in the National Parks, Law and Justice Policies in the NPS and YNP.
- New information and documentation generated during the preparation of this report will be housed with the YNP Cultural Resources records on this property.

The administrative background of the U.S. Commissioner's Residence demonstrates that the NPS has recognized its national importance, as part of the Fort Yellowstone/Mammoth Hot Springs National Historic Landmark. Provision for housing a U.S. Commissioner on site is essential to maintaining an efficient, responsive law enforcement program that provides for the safety and well-being of park staff and the visiting public, as well as ensuring protection for the unique natural and cultural resources that are a national treasure.

In 1999, YNP issued a sweeping "State of the Park," report, and in its Business Plan, summarized the park administration's responsibilities and strategies for "preserving Yellowstone's historic structures." "As a way to enhance preservation," the authors stated, "making use of these structures is important, even

when it may appear more efficient to construct a new building that meets the need."

In addition, the following stewardship goals were laid out for Historic Structures:

- Professional staff oversee an interdisciplinary program to inventory, preserve, and cyclically maintain historic structures.
- The most significant resources are evaluated and preserved according to standards for structures on the National Register of Historic Places. Visitor appreciation of park history is enhanced through interpretive efforts.
- Partners and cooperators share responsibility for managing historic structures still in use for visitor services.

The State of the Park report noted that many of the park's historic buildings required extensive work to prevent structural damage, thus the Commissioner's Residence is not alone in its need for attention and stewardship.³ In its 2003 Business Plan, the report summarized the park administration's broad program goals and its responsibilities and strategies for meeting those goals. Both natural and cultural resources were identified program areas for park stewardship, and the park's mission statement notes "Centuries-old sites and historic buildings that reflect the unique heritage of America's first national park are also protected." Responsibilities for meeting this mandate begin with the park administrators management team and the Cultural Resources Division of the Yellowstone Center for Resources with valuable support from the YNP Concessions program, private concessionaires and volunteer programs. The business plan further noted the 951 historic structures within the park, and its responsibility for stewardship.

MAJOR FINDINGS

The U.S. Commissioner's Residence has changed very little over time and retains a high degree of historic integrity; most original materials remain on site and are intact. Nearly all of the exterior materials are original to the building (or were repaired in-kind) and interior materials are original with the exception of impacts from the changes described below. Outwardly, the building continues to exhibit the military architectural style so distinctive at Fort Yellowstone, and which contributes to unique setting of the Mammoth Hot Springs enclave. Although the structure reflects its 1894 construction era in materials and finishes, the visual design character of this stone residence, built with materials from the surrounding area, is timeless as it relates to the natural setting of Yellowstone.

- Research to date, subject to change if new information is discovered, suggests that this is the oldest stone building at Fort Yellowstone and that the architectural patterning of this building may have influenced the design of the other stone buildings that followed.
- This building retains exterior integrity as an example of late 19th century stone masonry and military institutional building. Outwardly the building has changed very little, and a wire fence enclosure added in 1986 was designed to be inobtrusive and follow historical fencing patterns in the vicinity.
- The integrity of the interior architecture at the Commissioner's house has been retained. Significant changes to the interior include the removal of the jail cells in 1926 and an interior renovation in 1999 - 2001 to remove hazardous insulating materials, install new insulation, provide protection from radon, and upgrade electrical distribution systems. The character and design of the interior was respected with these changes.

- The U.S. Commissioner's Residence serves its original and ongoing function very acceptably, providing comfortable living quarters to the magistrate on duty in the park.
- In addition to the identification and significance of historic materials, this HSR looks in detail at the condition of the building. The evaluation included a basic analysis of seismic issues. It is recommended that a rigorous lateral analysis be completed as a follow-up and that stiffening of the first floor north and south walls be included within the preservation plan for the property.

RECOMMENDATIONS FOR TREATMENT AND USE:

The proposed treatment of the building is preservation of existing fabric and replacement with in-kind materials to the maximum extent feasible, with consideration to protection of persons and property from life - safety issues. The intent is to sensitively integrate repair materials, incorporate life - safety elements, and provide for continued use of the structure without compromising the historic character.

Summary of Recommended Improvements to Rehabilitate the Building:

RESIDENCE

1. Introduce additional seismic resistance. As a prelude to this work it is necessary to implement engineering documentation and testing to define the extent of this work.

2. Perform Fundamental repair of exterior stone masonry. Selected areas of the exterior stone exhibit significant degrees of deterioration that must be addressed.
3. Restore the front porch supporting system in-total.
4. Introduce additional heating (and cooling) capabilities within the house.
5. Exterior rehabilitation of windows and doors.

CARRIAGE HOUSE

1. Re-roof the Carriage House.
2. Verify the adequacy of the foundation for the Carriage House.
3. Rehabilitate the exterior windows and doors.
4. Re-paint and seal exterior wood siding and trims.

ENDNOTES Executive Summary

¹ Fort Yellowstone NHL nomination, p. 49.

² Ibid. p. 25.

³ Yellowstone National Park, The State of the Park, (Mammoth Hot Springs: National Park Service) 1999, p. 4-13.

PART 1: DEVELOPMENTAL HISTORY

NARRATIVE HISTORY AND SIGNIFICANCE

The U.S. Commissioner's Residence is listed as a contributing building within the Fort Yellowstone/Mammoth Hot Springs Historic District, National Historic Landmark, significant on a national level under Criterion 1 *for its ability to outstandingly represent, the broad national patterns of United States history and from which an understanding and appreciation of those patterns may be gained. The Fort Yellowstone District is significant for its association with the military administration of Yellowstone National Park and for the impact the principles and policies developed during the military administration of Yellowstone had on the emerging conservation and national park movements in the United States in the late nineteenth and early twentieth centuries.*¹ Specifically, the commissioner's residence had a role in developing principles and policies toward conservation and national park stewardship during the time that the U.S. Army administered Yellowstone National Park. Such early management decisions and directives set a significant precedent at the founding of the National Park Service and were embraced by multiple generations of federal officials in the years that followed.

A primary building in the Fort Yellowstone/Mammoth Hot Springs Historic District, the U.S. Commissioner's Residence embodies architectural values recognized under criterion C on a local and state level as the first stone structure of substantial profile in the park, introducing building patterns common to the nation's 19th century military installations.

The period of significance for the Fort Yellowstone NHL is 1888 – 1918, encompassing

the time that the earliest extant building was constructed for governance of the park through the year that the Army's tenure at the park ended and troops were withdrawn.

The U.S. Commissioner's Residence was constructed in 1894, just a few short years following the establishment of Fort Yellowstone. It was the first substantial stone building to be erected within the Fort Yellowstone installation, setting the stage for buildings that followed. Although not specified in the original NHL documentation, the appropriate period of significance for the US Commissioner's Residence is 1895 through 1918.

Establishment of Fort Yellowstone

When Yellowstone National Park was established on March 1, 1872, Congress envisioned its mission as "a pleasuring-ground for the benefit and enjoyment of the people." The park's Organic Act followed, establishing a mandate for the "preservation from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition." Even before its designation as the nation's first park, reports from such parties as the Hayden Expedition had widely broadcast the natural wonders of Yellowstone, and thus with establishment of the park, people began to visit, to witness and to experience firsthand the unique geological and natural features of the area.

Initially, the park was managed by civilian superintendents, beginning with Nathaniel Langford appointed the first year, whose primary charge was to protect this first park and preserve

its natural resources. It was a tall order, given the vast and complex landscape contained within the 3,348 square mile park and the fact that during his term there were no funds for the park or staff to carry out the mission. Early administrators, then, lacked the manpower and the enforcement skills to adequately police the park, and the first appropriation, secured in 1878, was dedicated largely to road building and creating the park's first infrastructure. That year, the park's second superintendent, Philetus W. Norris, proposed a "small military post, or at least a summer camp, at the Yellowstone or Henry's Lake, or the Forks of the Firehole between them, could offer the needed protection."² Short of that, Norris had his crew begin to build the first rough log buildings for kitchen and a lodge, along with a military-style blockhouse to fortify the northern entrance to the park.

In 1880, Norris hired Harry Yount as gamekeeper and he conducted a reconnaissance of the park. At the end of the summer, Yount reported that protection was needed throughout the park and recommended a "small, active, reliable police force" to keep animals from being "slaughtered by tourists and mountaineers."³ With staffing next to non-existent, buffalo, elk, moose and other animals were hunted indiscriminately and as NPS historians have noted, "Poachers killed animals. Souvenir hunters broke large pieces off the geysers and hot springs. Developers set up camps for tourists, along with bath and laundry facilities at hot springs."⁴

Reports of such depredations continued to reach Washington D.C. The third, fourth and fifth superintendents of Yellowstone, between 1882 and 1885, in a by-then familiar refrain, described rampant vandalism, squatters and poaching. Over time, such influential visitors as General Phil Sheridan and John Wesley Powell toured the park and reported back that a solution to the vandalism and poaching was imperative. In a sign of their clear displeasure, in 1886 the Congress withheld funding from the park. That year, the Secretary of the Interior turned to the Army, and under the 1883 Sundry Civil Act requested relief from the Secretary of War. In a move that set the stage for

military oversight of the park for the next three decades Troop M, First United States Cavalry, Fort Custer, Montana Territory were requisitioned to the park under Captain Moses Harris.

In short order, Captain Harris established a military presence throughout the park, posting men at Soda Butte, Riverside, Grand Canyon, Upper and Lower Geyser Basins, Norris Geyser Basin and Mammoth Hot Springs. In addition, mounted troops patrolled the park.

The troops were stationed initially in a series of wall tents set up along the base of the Mammoth Terraces, along with several rough lumber buildings including a superintendent's office/residence, frame cottages and a stone magazine.⁵

Through these years, administrative officers developed plans to better protect the impressive abundance of wildlife in the park, control fire and enhance camping and fishing opportunities for visitors. Five years later, the Department of the Interior granted permission to appropriate \$52,000 to begin construction of more permanent buildings – residential quarters, barracks, offices, a warehouse, commissary, stable, granary, bake house and guard house – for the Fort Yellowstone compound. The Secretary of Interior also gave permission to collect lumber, logs, rock, limestone, sand and other building materials in the surrounding area, and construction of these buildings began in 1891, on a site southwest of the Mammoth Hotel.⁶

Troop M continued their vigilance in the park, through year-round patrols and outposts at the park's boundaries. The need for greater authority and oversight of the park led Congress, in May 1894, to pass "An Act to protect the birds and animals in Yellowstone National Park, and to punish crimes in said park, and for other purposes." The Lacey Act, as it became known, placed Yellowstone National Park under the jurisdiction of the United States, and a U.S. Commissioner was appointed to the post.

On July 2, 1894, Acting Sec of the Interior Wm H. Sims issued a request for proposals based upon specifications for the "construction of a stone building, at Fort Yellowstone, Wyo., to be used as

Jail, Office for U.S. Commissioner, and residence for U.S. Marshal." He requested separate bids for construction of the building and for kitchen range, fence and outbuildings. The contractor was permitted to use rock, sand, lime and lumber from within the park and walls were to be of "the best building stone to be found in the vicinity, of large stones laid on the natural beds." The walls were to be straight and plumb with full joints and built with a "Dog-tooth Bond." On the interior, again, the quality was to be of the highest grade. "All inside lumber will be best Oregon pine, and lumber exposed will be best white pine, unless otherwise stated."⁷

That same day, Sims wrote to Acting Superintendent Captain George S. Anderson, to inform him that a solicitation for proposals to be opened on July 17, 1894 had been advertised in the Helena, Montana daily papers, and directed Anderson to convene a board to review the proposals and forward their recommendations "regarding the award of contract for the construction of the building" to the Department of Interior.⁸

On August 30, Helena architect Fisk J. Shaffer was awarded the contract to construct the U.S. Commissioner's house and jail with a completion deadline of November 15th, that same year. It appears that Superintendent Anderson had been bargaining with Contractor Shaffer before the formal issuance of bids, for Shaffer wrote him on June 4, 1894 that he (Shaffer) was enclosing "sketches you gave me upon [my] leaveing [sic]."⁹ Enclosed were sketches of the proposed building, but these were slightly different from the blueprint plans that Shaffer submitted later. On June 17, Anderson submitted Shaffer's formal blueprints for the building to the Department of Interior, and on July 2, Interior returned those plans with suggestions for modifications—namely the placing of an iron door for extra security at the end of the corridor that led to the jail cells and a solid wooden door on the outside of the building.¹⁰ Wasting no time, Anderson announced on July 2 that bids would be accepted for the new building.¹¹ Shaffer was awarded the contract. Anderson drew up the official contract and sent it

to the Department of Interior, which approved it on August 30.¹²

That fall, the Superintendent's 1894 Annual Report noted that the Military Post that year had seen the completion of a post hospital and quarters for the hospital steward, and that construction of a building to house a jail and office for the U. S. Commissioner was "just being commenced upon it. It is hoped that it will be ready for occupancy before winter."¹³ A final review was required to put the building in service. Anderson appointed U.S. Commissioner, J.H. Meldrum and two officers of the 6th Cavalry, Capt. G.L. Scott and 2nd Lieutenant Elmer Lindsley to the task of inspecting the building and its conformance to the contract. They gave their approval on December 4, 1894 and shortly after that time the Department of Interior approved plans to connect the building to the park's water supply.¹⁴

Construction of U.S. Commissioner's House¹⁵

The following year Anderson again mentioned "the building erected last year as a jail and used also as a residence by the United States Commissioner." Anderson went on to further describe Judge Meldrum's house:

For this...building, the Government appropriated \$5,000. The contract was awarded late in July, and the building was finished in time for occupancy in the early autumn. It is a substantial, well-constructed, secure building and the only one in the Park built of stone. It is situated about 150 yards from the Liberty Cap and about the same distance from the old McCartney building [behind it in Clematis Gulch], and at the base of the hill which skirts the Cottage Hotel.¹⁶

The initial resident of this building, Judge John W. Meldrum, was also Yellowstone's fourth U.S. Commissioner.¹⁷ Appointed upon Congress's passage of the "Lacey Act", Meldrum arrived in the park in July of 1894, after having had great difficulty getting there because of a national railroad strike. "Provisions had been made to erect my house," said Meldrum,

[and] plans had been drawn, sent to Washington, approved, and returned to the Superintendent of the Park. He advertised for bids. Nobody bid on account of the [railroad] strike, they couldn't get any material in here. So they had to re-advertise after I got here. Finally they got the railroad trouble settled and we never got started with the work until the last of August, or early part of September.¹⁸

Meldrum ended up overseeing the construction of his own house, as his first task after his arrival at Mammoth Hot Springs. He met Park Superintendent George Anderson immediately upon arrival, and he and Anderson "hit it off" positively. According to Meldrum, the building's construction was so much a fiasco that it is somewhat surprising that it was built at all. In the early 1930s, Meldrum related the story to Joe Joffe right inside the stone house, and Joffe recorded it as follows:

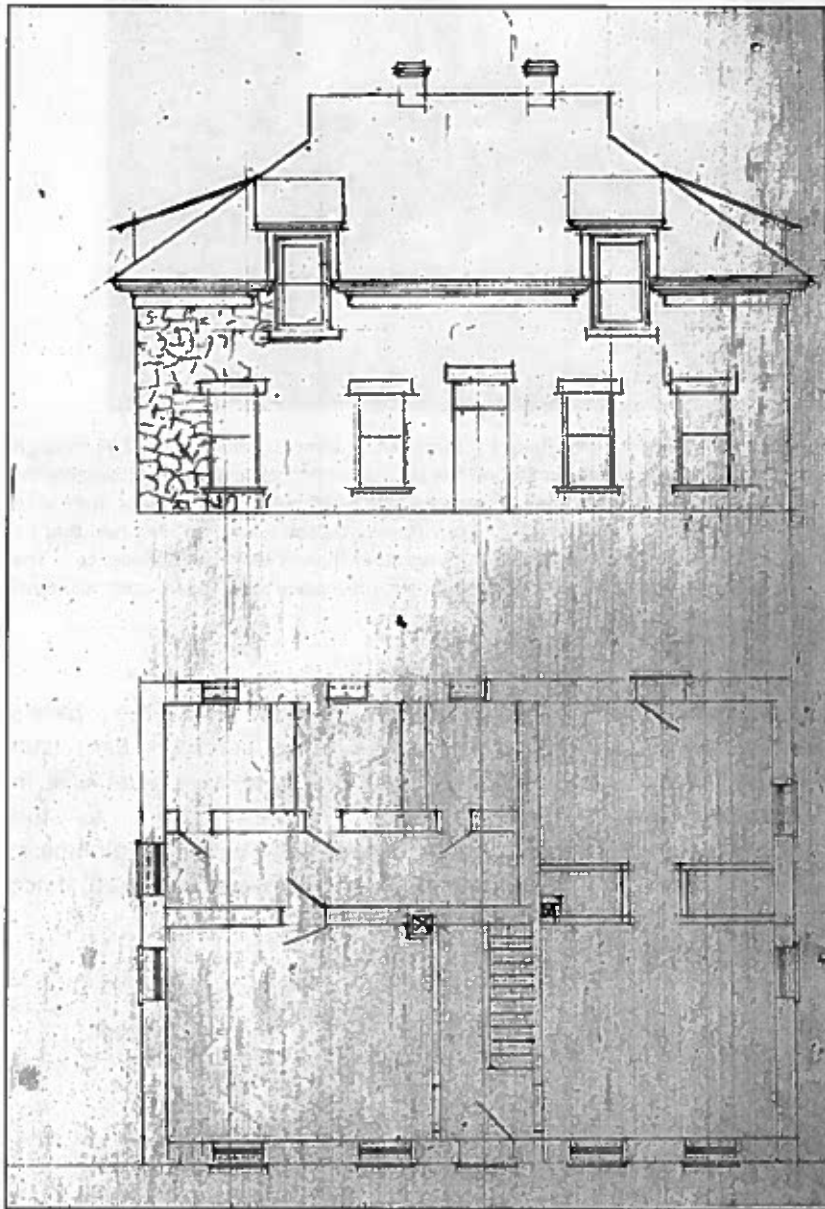
The plans [for the building] had been drawn by a private soldier down here [at Mammoth] and when they came back [approved by the Department of Interior] and [the U.S. Army] started the building, Anderson made this soldier superintendent of the work. He had drawn the plans and had the specifications and [supposedly] knew how it ought to be done. So the soldier became the superintendent on the job. Well, knowing something about building myself I used to just loaf around and see what they were doing. Anderson told me to look over the plans and specifications. I stayed around until they got the foundation in and they were just putting in the wall along those windows there. I told the man that he was not building that wall according to specifications. He just kind of looked at me. I told him that I expected to occupy this building when it [was] completed and I was going to try to have it built according to specifications. Well, he looked at me as if to say "Who the devil are you, I'm doing this!" When this soldier would come around to inspect they would fill him up with beer and he didn't know whether they were putting the

stones upside down or not. I told Captain Anderson they were not putting the building up according to specifications. Anderson was a very profane man. [So] It probably wouldn't pay to put down what he said. But he did tell me what to do. I told him if he would give me authority to erect the building I would see that it was done right. He told me to go ahead. In the meantime he wrote to Washington. The letter was referred to Senator Joseph M. Carey, the present senator's (Robert D.['s]) father. The letter was put up to Senator Carey, and he said he knew me and that I was thoroughly competent to [be] superintendent [of] the erection of that building. So I received a letter from Washington, through Anderson, to put me in charge of the building, and from that time on I was the real boss. Well, it was just a fight [for] the whole summer. They were building that outside door, laying up the rock, and I went out and said to the man who had charge that it was not [being built] according to specifications. I told him that if he didn't tear that out and build it up according to specifications he could just quit, [and] that they would never get a dollar for what they did here. So they all quit. They went to the Cottage [Hotel], boozed up for two or three days, and then went back to work. And that is the way it went. I told the foreman that there were a lot of things they were doing which were not according to specifications, and that he knew it, but that they were slight and didn't make much difference, but I didn't want him to think for a minute that I was overlooking them.¹⁹

Shaffer's original blueprints,²⁰ reproduced below, consisted of two pages, each page showing floor plans for the building plus one cross section—the first floor of the building (AD 1857) showing the three jail cells plus office, dining room, and kitchen, and the second floor of the building (AD 1858) showing four bedrooms upstairs. With his letter of June 4, 1894, Shaffer included a "Memoranda of Sketch," so between it and the blueprints themselves, we can be certain of what Shaffer intended for his new building.²¹

Shaffer's first floor plans showed three jail cells in the northwest (today southwest) quadrant of the building, each 6'8"x7'2"x8' in height. A kitchen located in the northeast (today northwest) quadrant of the building was ten feet by fourteen feet by nine feet high with a large "range" shown next to a "closet" and a small "pantry" at the southeast. An office located in the southwestern

quadrant of the building was ten feet by seventeen feet three inches by nine feet high. Finally, the dining room, located in the southeastern quadrant of the building, was fourteen feet by fifteen feet in size with no height listed.²² According to Horace Albright's card file, the cost of the entire building was \$5,000.²³



Preliminary plans for Judge's house, 1894. F.J. Shaffer to Maj. [George S.] Anderson, June 4, 1894 in Microfilm 2, Item 8, YNP Archives.



Upon completion, Meldrum moved in and occupied the house throughout his term as U.S. Commissioner, from 1894 through June 30, 1935.²⁴ It seems not to have been long before Judge Meldrum found the jail cells in his house to be unacceptable for the incarceration of prisoners. In May of 1895, he told the U.S. Attorney General that his building was in bad shape and asked for a new jail to be built, estimating its total cost at \$146.85. In June, Wyoming attorney Gibson Clark told Meldrum that he thought it would make more sense to confine prisoners in the old army guardhouse rather than in Meldrum's residence.²⁵ The outcome of this petitioning is unknown, but it appears that the Magistrate's home may never have been used to house prisoners.²⁶

Within a few years, Meldrum requested repairs be made to his building and a barn (really a carriage house) built, but it seems to have taken awhile to get approval due apparently to Congress's slowness in appropriating the money. Meldrum asked for these considerations in December of 1899, but not until the summer of 1901 was he able to obtain

\$450 for the repairs and the barn's construction.²⁷ Thus the building's barn (still standing in 2010) seems to have been built in 1901 or 1902. Further repairs to the commissioner's building—painting, plumbing, and ornamental fencing—were discussed, if not performed, in 1909.²⁸



Judge John W. Meldrum sits in one-horse carriage with woman driver, photographed in front of his house, circa 1897. YELL 51464.

After this, workmen made occasional repairs and modifications to the building, although it is likely that information on all of these repairs has not been found. According to park records the building's three jail cells were removed in 1926; current judge Stephen Cole has stated: "You can see where the bars were cut out of the windows and the walls [there] are about 18 inches thick." The NPS painted the outside of the building in 1922, rewired Judge Meldrum's quarters for electricity in 1926, kalsomined the walls of his office and pantry in 1926, and kalsomined another (unspecific) room in the building in 1927.²⁹

Drawings of the building at the NPS's ETIC center in Denver make it appear that workmen installed a "new heating layout" and proposed a revamping to the cellar stairs in 1939.³⁰ Photos taken in 1917 and 1949 show that the building had been reroofed by the latter date and that

Judge Meldrum's fence and its gate had been removed from the building's front yard. Lilac bushes on the south and east (porch) sides of the house were falling into desiccation by 1949.³¹

In 1949, NPS employee Philip H. Wohlbrandt prepared a historic structures report for the National Park Service that gave further information on the building, then fifty-four years old. He stated that the building occupied 41,600 square feet,³² contained eight rooms plus bath, and was built of stone on concrete and masonry with walls of frame, lath, and plaster. The building had modern plumbing, was heated by an oil furnace, and had electricity for lights, refrigerator, and a kitchen range. Wohlbrandt rated the building's structure and mechanical portions as only "fair" condition, put the value of the building at \$53,600 and rated its soundness as follows:

...fair to good condition. Points of deterioration include the stone piers which

support the wood porch, and the roof surface which is covered with worn and curled wood shingles. The flashing between the roof and wall is also rusted and deteriorated. The top wooden portion of the doors have [*sic*—has] points of decay and [is] in need of paint.³³

In 1976 - 1977, Lance R. Williams and James Muhn updated the historic structures report, stating:

Since its occupation in 1894, this building has housed the U.S. Commissioner. The occupancy of the residence by persons appointed to the same position is a part of the unique significance of this building. It furthermore is a very fine-looking stone building which came prior to the other stone buildings at Ft. Yellowstone. This one stands by itself, close to the Hot Springs terraces and is of a slightly different type of stone construction and appearance than [are] the other stone buildings across the Mammoth plateau. Originally a jail cellblock, in addition to an office for the U.S. Commissioner, was designed into the structure. However, it has never been used as a jail because the guardhouse at Ft. Yellowstone was adequate for this purpose. The U.S. Commissioner has maintained his office in the residence. In association with HS-49 is a garage, no. 334, located somewhat behind the building.³⁴

Quoting David Battle and Erwin Thompson's historic structure report on Ft. Yellowstone, Williams recorded the building as "a two-story rectangular structure with walls of local sandstone and a hipped roof covered with wooden shingles. A pair of shed-roofed dormers look[s] out on each side from the second floor,

and the roof is crowned by two chimneys at the ridge. A long covered porch runs the length of the front of the building, which faces the fort to the east. Wood doors and windows were used throughout, and were painted, as were the rest of the trim, fascias, etc.' Window sash is primarily one over one double-hung. Unlike most of the other buildings at Ft. Yellowstone which have exposed rafter tails, this building has a soffit."

Williams continued:

Battle and Thompson report the building to be in basically sound and good condition, with its historic appearance fairly intact, there being only minor changes such as the removal of one chimney, slightly different roofing treatment, and lattice-work closing off the sub-floor area of the front porch. The [this] LCS investigator cannot attest to the changes in historic appearance; however, in conversation with some of the [park's] maintenance personnel, and then later during on-site investigations, [I noted]...that the residence has some substantial problems in terms of its physical condition. The largest problem appears to be the foundation, which at the southwest corner has settled or somehow has changed such that the wall has some severe cracks in it. There is further cracking on the west façade. The front porch has settled and requires painting as do some of the other portions of the building. The roof shingles have begun to curl and will need oiling as a result. The building has been repointed [*sic*—repainted], but the writer does not know when.³⁵



Judge John W. Meldrum stands at rear of photo, circa 1897. The women—probably Meldrum family members—are all unidentified, although the woman third from left is probably Mrs. Meldrum. Woodwork on the screen door is ornate. This photo was apparently taken at the rear of the house. YELL 51521.



Judge Meldrum's house with fenced yard. The photo is undated, but the presence of Ole Anderson's "Specimen House" next door dates the photo to 1908 or later. YELL 51472.

The Commissioner's Residence 1981-2009³⁶

Current U.S. Commissioner Stephen Cole, who moved into the residence in 1981 with his wife Maureen, has provided an abundance of information about the building during his period of occupancy. According to Cole, the NPS performed almost no maintenance on the building from 1981 until the late 1990s, except to paint the stairwells and the downstairs window frames white, thus changing them from a "battleship gray" color. The window frames upstairs are made of oak, according to Cole, and the banister that was gray before 1981 is now white.

The NPS performed major renovations on the building from late 1999 through May of 2001, according to Cole. A major problem was the discovery of Vermiculite (asbestos) in the house, and the Coles were displaced from the residence for more than a year while asbestos abatement was occurring. During this period, the NPS "removed lath and plaster" and "put in smaller stud walls and reinsulated" the building. They also cut part of the jail's length and "made a pantry (shelves and cabinets) in the place where they shortened the jail." Cole added that the jail's bathroom became the downstairs bathroom. And oddly he notes, "the front door bangs into a stairway, that is, there is no passage between the dining room and the living room."

As for the building's heating, the daughter of Judge T. Paul Wilcox—who with his family occupied the residence after John Meldrum died in July of 1935—told Cole that the NPS installed a "furnace" in the residence "before or just after" the Wilcoxes moved in. This was probably a coal-driven furnace, for Cole remembers having learned of a coal shed (now gone) behind the house.

The NPS also replaced the building's electrical wiring in 1999-2001. Cole says NPS electrician Harold Anderson told him before the renovation that none of the residence's electric wiring was newer than pre-World War II (the 1930s) and that much of the wiring appeared to have been installed just after World War I (1917-1918, this

may well have been the 1926 electrification as mentioned earlier). Ungrounded electrical outlets were a particularly dangerous problem. NPS workers removed and replaced all of the old wiring between 1999-2001. According to Cole the building's foundation remains "wobbly" today (2009) and should probably be replaced at some point.

On the interior, Judge Wilcox built the bookcases in the living room, for he was "an avid reader" according to Cole. He added, "In 1999-2001, I had [the NPS] build another bookcase on the south wall of that room and they also built a china closet in the dining room."

The building's "barn", according to Stephen Cole, contains a tack room, two stalls for horses, and a big room that Cole says was used for Judge Meldrum's carriage. Cole expressed concern that the place today is "falling apart," and that "the roof is going to fall in one of these days if they don't do something about it."³⁷

In conclusion, the Judge's stone residence near Liberty Cap at Mammoth Hot Springs—a federally-owned building—has been continuously occupied by a U.S. Commissioner since 1894. A number of magistrates have occupied the building, beginning with John W. Meldrum. There have been no major additions to the building over the years, but some renovations have occurred, notably the addition of a carriage house (barn) in 1902 or 1903, the removal of jail cells and "rewiring" for electricity in 1926, the installation of a new heating layout in 1939, and a large renovation during the period 1999-2001 involving complete electrical rewiring and asbestos abatement.

ARCHAEOLOGICAL CONSIDERATIONS

In addition to presenting the documented history of the U. S. Commissioner's House this report is intended to raise the awareness of all cultural values and to create a foundation for continued research into the building; its occupants, designers, and founders; its site or location; and the history of events surrounding the building. Although not the primary purpose of this report, it must be recognized that understanding the occupation of the site over time has the potential to yield additional information that can contribute to the story of this location from both

the standpoint of pre-history as well as history. For this reason it is recommended that all ground disturbing activities be observed with sensitivity regarding archaeological values.

If buried features related to history or pre-history are encountered or if artifacts are unearthed that are thought to have the potential to add to the history of the facility or occupation of the site prior to construction of the current building we recommend consultation with the Park Archaeologist, Historian, or Historic Architect.

PHOTOGRAPHS AND PLANS



U.S. Commissioner's Residence 1917.



U.S. Commissioner's Residence 1949.



Date of photograph: 6/10/94

U.S. Commissioner's House, 1994.



Yellowstone National Park
Mammoth
Qtrs. - Judge's Residence
Building No. 49

U.S. Commissioner's House, 1994.



U.S. Commissioner's House, 1997.



U.S. Commissioner's House, HABS survey Jet Lowe, view north rear WY - 140-1 ~ 1983

HISTORIC PLANS

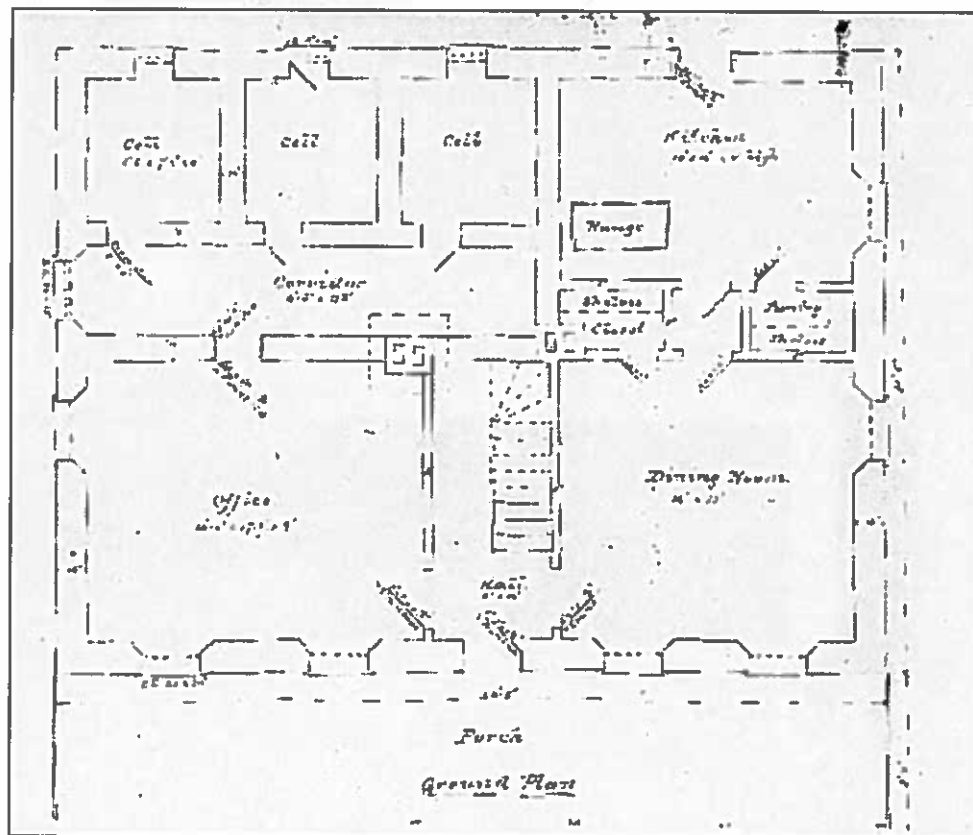
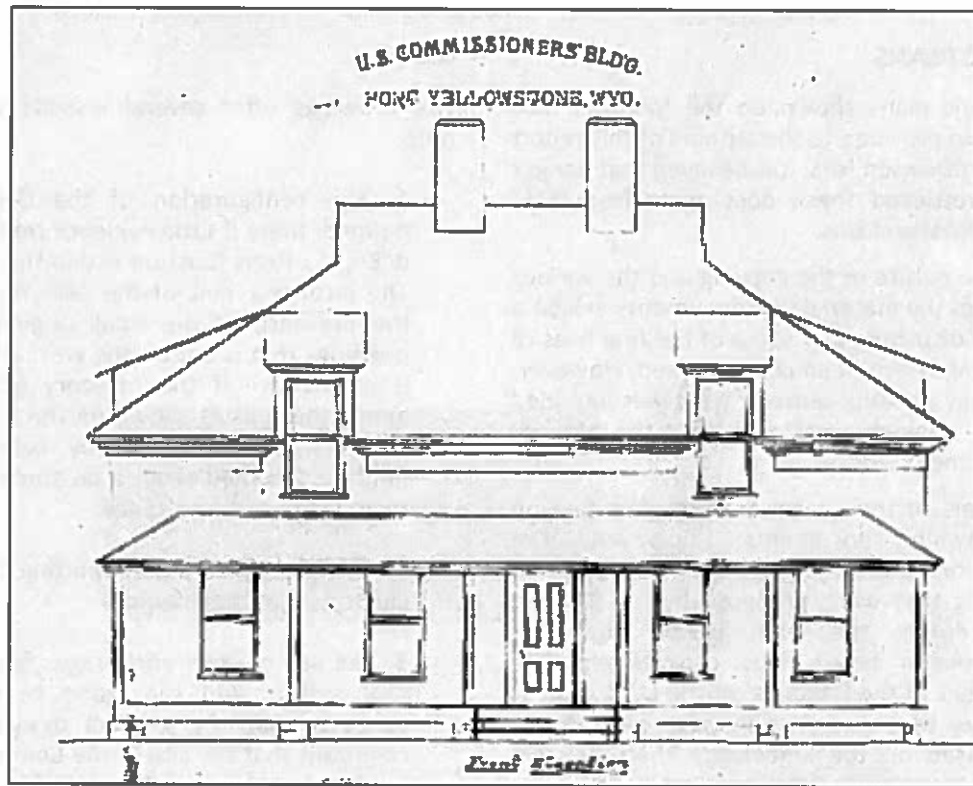
The historic plans shown on the following five plates were provided to the authors of this report by Herbert Dawson NPS. It is believed that Ranger Dawson retrieved these documents from ETIC governmental archives.

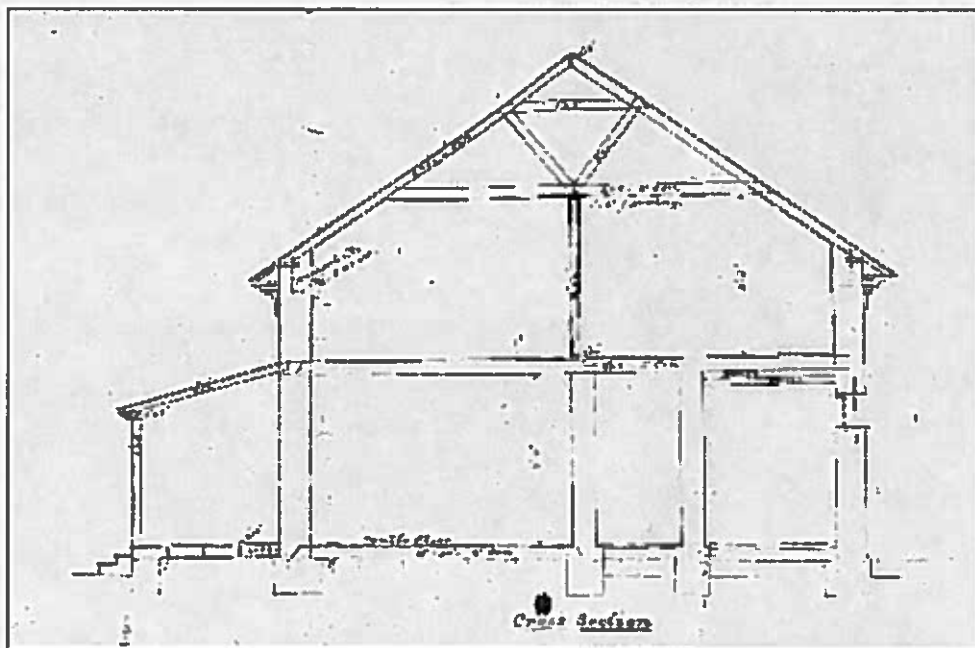
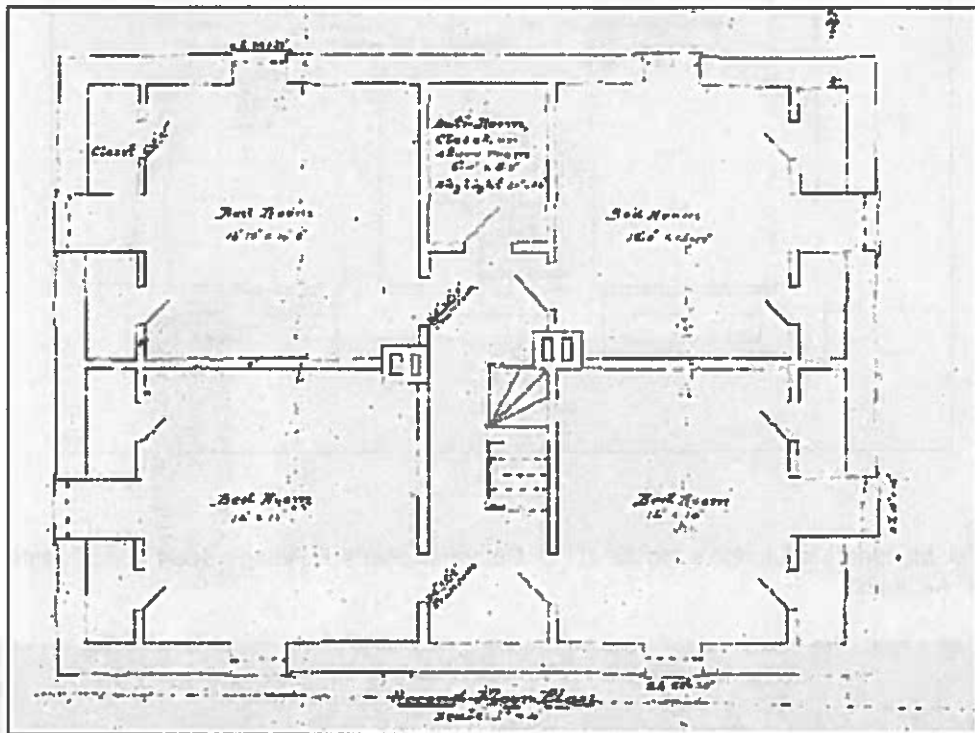
Due to the nature of the copying and the various transfers of the material, the documents exhibit a degree of distortion and some of the fine lines of the drawings have been compromised. However, they convey a strong sense of what was intended by the original designers of the U. S. Commissioner's House.

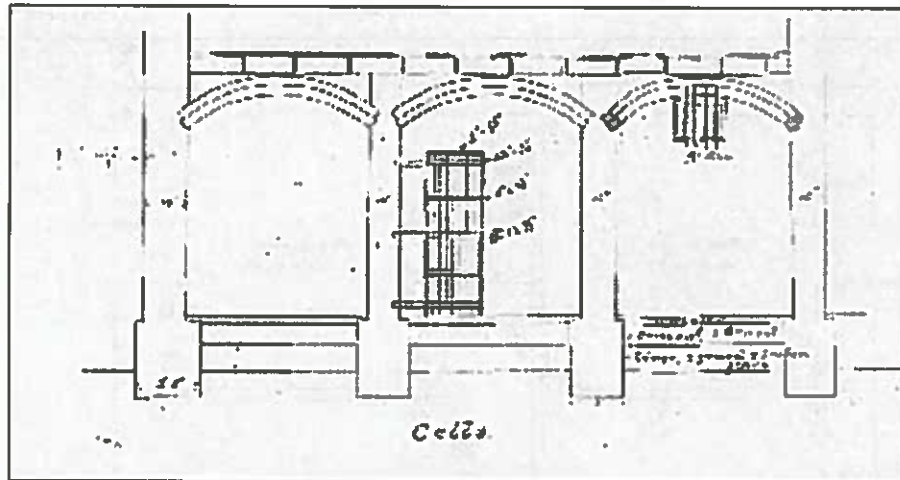
The authors of the design are not identified on the drawing documents; however, the presentation of the drawings is characteristic of documents that were prepared by, or for, the military during the time period that the Commissioner's house was constructed. The 'Department of the Dakota's' of the U. S. Army is one agency that may possibly have created this design based on the knowledge that they did develop other drawings for the Fort Yellowstone complex.

The drawings offer several insights worthy of note:

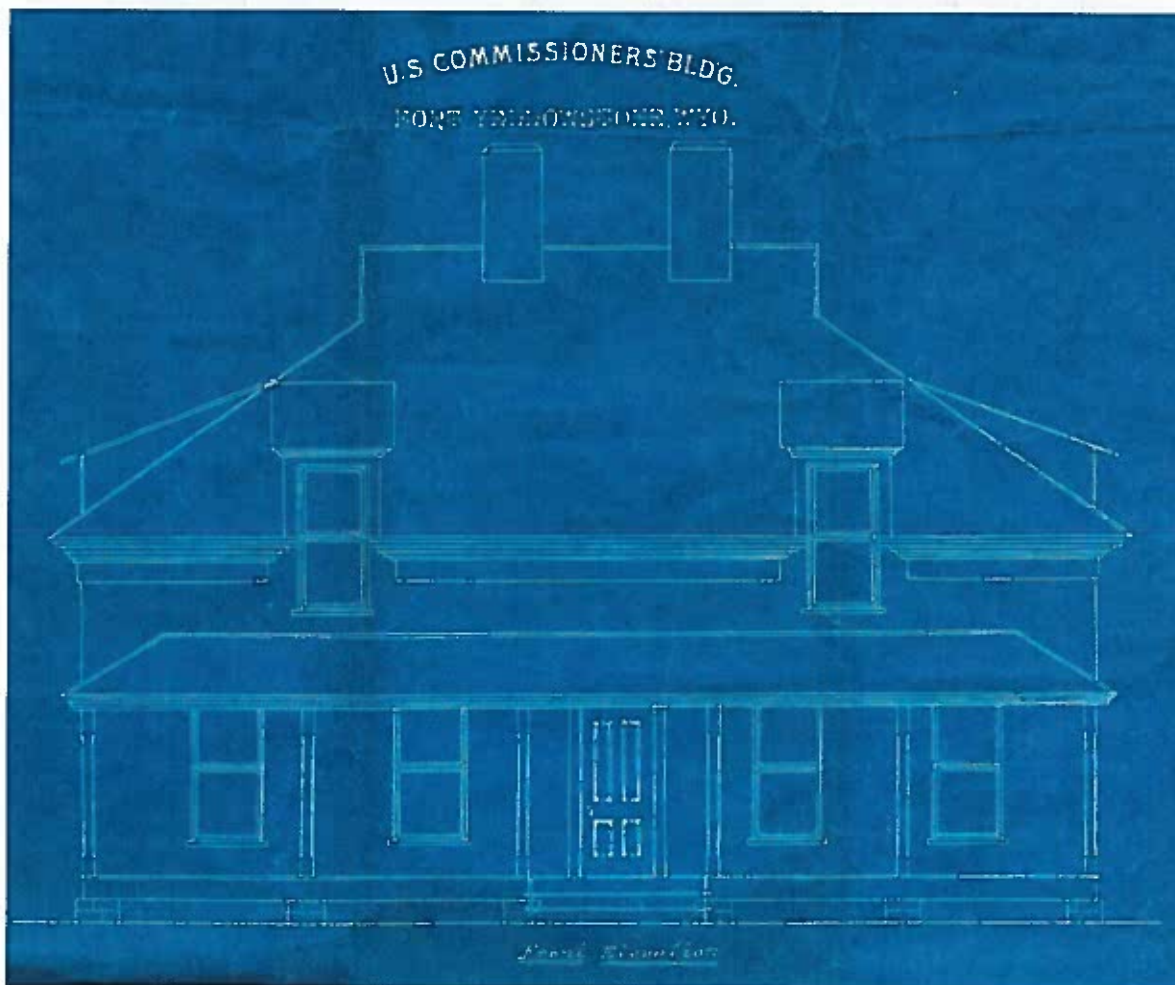
1. The configuration of the Cell area is defined; there is little evidence remaining on-site of this function within the structure. The strongest hint of the cells remaining is the presence of the small original window openings that occur on the west elevation. It is not known if the masonry arches exist above the cells as shown on the drawings; if so they are concealed by contemporary finishes. It would require destructive testing to ascertain their presence.
2. The nature of the supporting footings is illustrated on the drawings.
3. The use of steel anchorages between the roof system and the stone bearing walls suggests that the original designers were cognizant that the site of the Commissioner's house was potentially unstable, perhaps because of the proximity of the structure to active geothermal features.

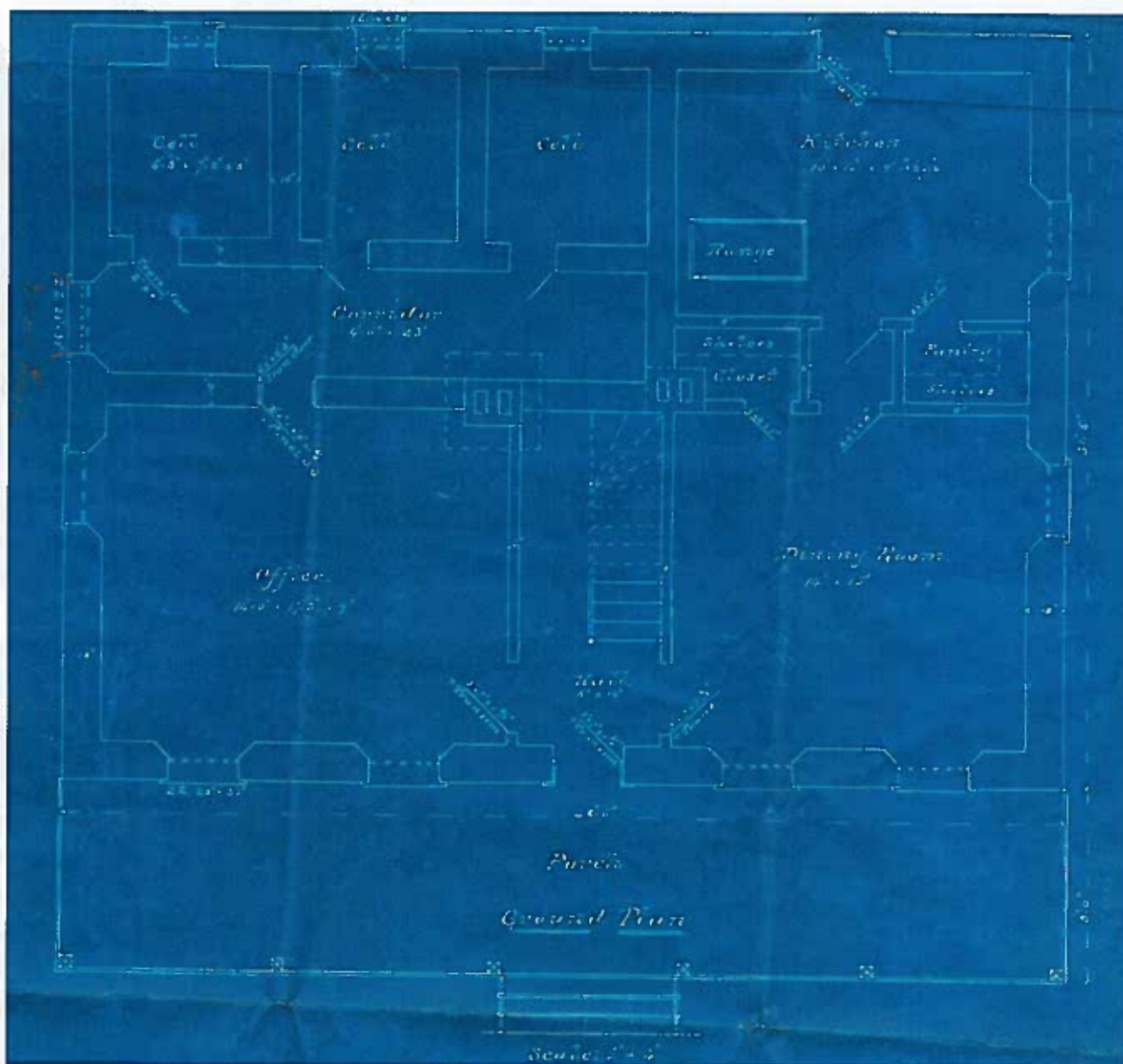




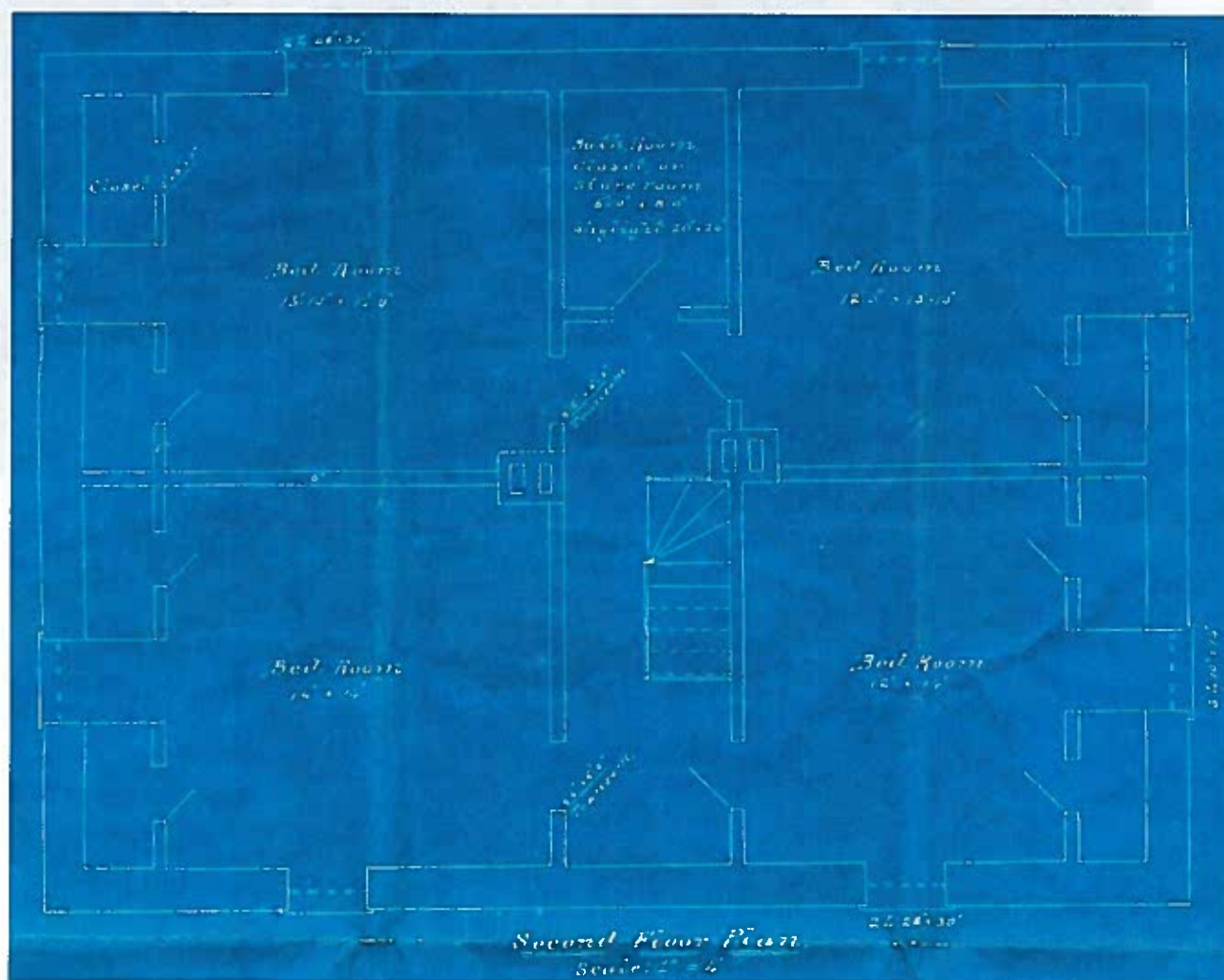
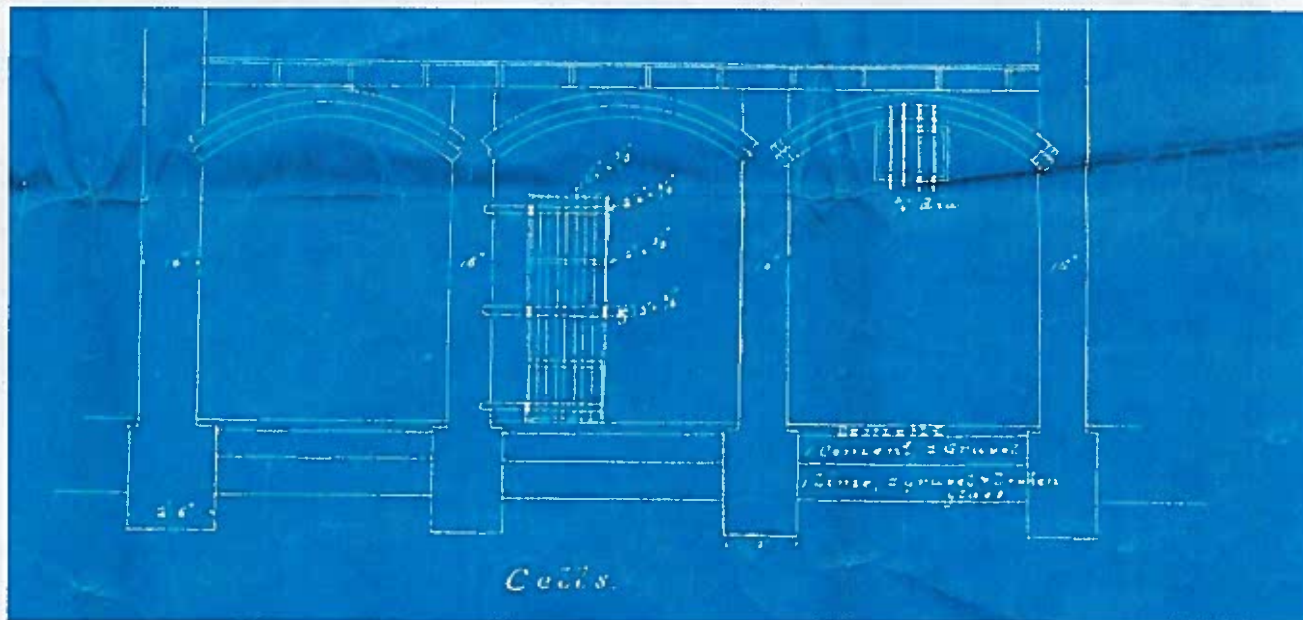


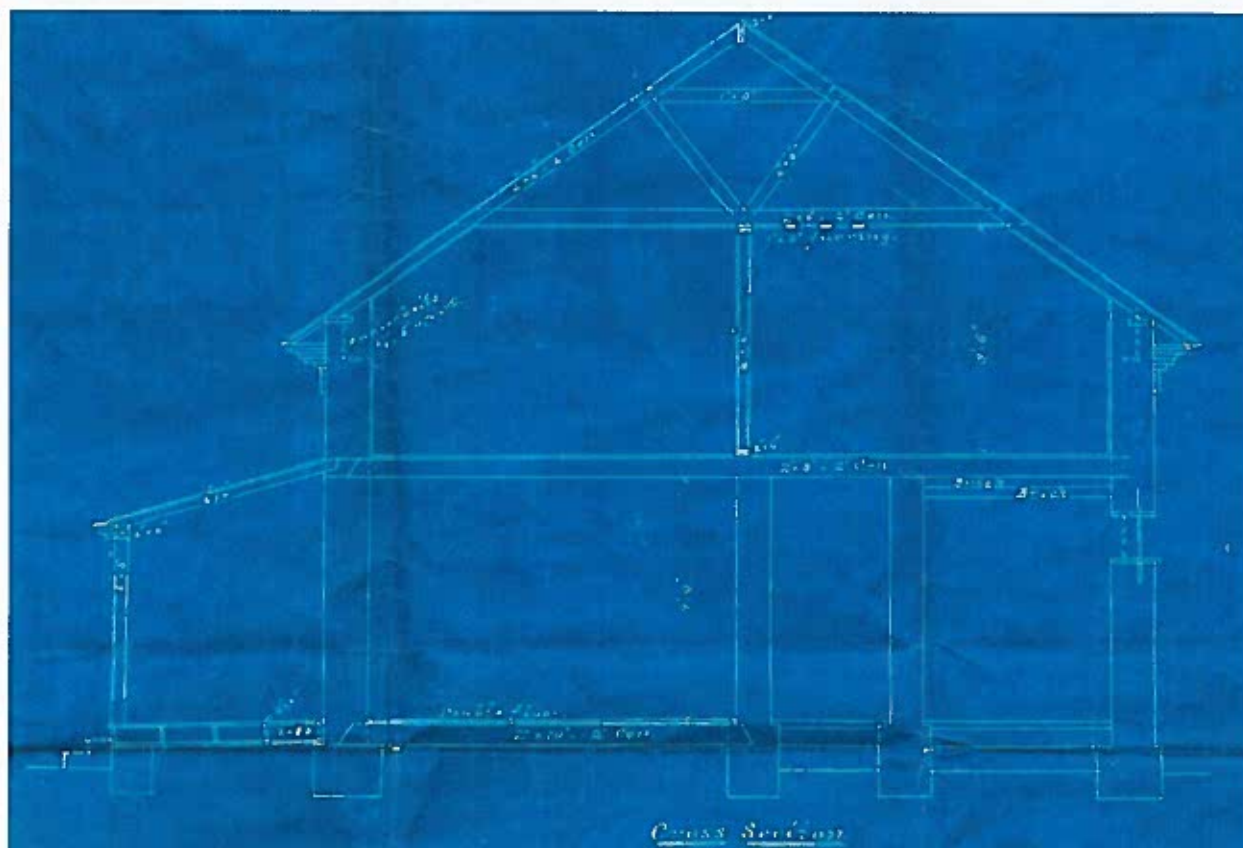
F.J. Shaffer blueprints of Judge's House (U.S. Commissioner's Building), 1894. Documents 1857 and 1858, YNP Archives.





Document 1858, YNP Archives.





1. The drawing is a cross-section of a building, showing the internal structure and the placement of windows and doors. The drawing is labeled "Cross Section" at the bottom.

2. The drawing shows the internal structure of the building, including the roof truss system, the main floor, and the foundation. The roof is gabled, with a central ridge and sloping sides. The walls are shown in cross-section, revealing the internal structure and the placement of windows and doors. The floor is shown as a horizontal line, and the foundation is shown as a series of rectangular blocks.

3. The drawing is a detailed architectural cross-section drawing of a building. The drawing shows the internal structure, including the roof truss system, the main floor, and the foundation. The roof is gabled, with a central ridge and sloping sides. The walls are shown in cross-section, revealing the internal structure and the placement of windows and doors. The floor is shown as a horizontal line, and the foundation is shown as a series of rectangular blocks.

4. The drawing is labeled "Cross Section" at the bottom.

ENDNOTES Part 1

¹ Fort Yellowstone NHL, p. 25.

² Norris, 1878 report to the Secretary, as quoted in *Historic Resources of Yellowstone National Park, 1872-1966*, by Mary Shivers Culpin, NPS, Denver, p. 3.

³ *Ibid.* p. 5.

⁴ <http://www.nps.gov/yell/historyculture/ftyell.htm>, accessed July 10, 2010.

⁶ *Historic Resources of Yellowstone National Park, 1872-1966*, by Mary Shivers Culpin, NPS, Denver, p. 12.

⁷ William H. Sims, "Specifications for the construction of a store building, at Fort Yellowstone, Wyo., to be used as Jail, Office for U.S. Commissioner and residence for U.S. Marshal, Document 2453, YNP.

⁸ Doc. 1852, July 2nd, 1894 Correspondence from Wm. H. Sims, Acting Secretary of the Department of the Interior to Capt. George S. Anderson, Acting Sup't Yellowstone National Park, Mammoth Hot Springs, Wyoming.; Doc. 1853, Advertisement for "Proposals for erection of Jail building, etc."

⁹ F.J. Shaffer to Maj. Anderson, June 4, 1894, in Microfilm 2, Item 8, YNP Archives.

¹⁰ Archive Document #1852, Acting Secretary of Interior to G.S. Anderson, July 2, 1894, YNP Archives.

¹¹ AD #1853, Anderson's bid announcement, July 2, 1894, YNP Archives.

¹² AD #1856, William H. Sims of DOI and Fiske J. Shaffer, signed August 30, 1894, YNP Archives.

¹³ Doc 1859, Agreement between United States of America and F.J. Shaffer of Helena, 30 Aug 1894. 1894 Annual Report Superintendent Yellowstone National Park.

¹⁴ Doc 1854, Proceedings of a Board Convened by the Following Order, Mammoth Hot Springs, 4th Dec. 1894; AD #1848, Assistant Secretary of War to Secretary of Interior, July 14, 1894, YNP Archives.

¹⁵ This section authored by YNP Historian Lee H. Whittlesey, "The Judge's House": A History of the U.S. Commissioner's Residence at Mammoth Hot Springs, Yellowstone National Park, Wyoming, January 2009, YNP Archive.

¹⁶ Anderson, *Report of the Acting Superintendent... 1895* (Washington: GPO, 1895), p. 5.

¹⁷ The three earlier commissioners—who have also been known as "judges" or "magistrates"—were N.D. Johnson, Samuel S. Turner, and Ellery C. Culver, although their jurisdictional powers were uncertain and limited. Aubrey L. Haines, *The Yellowstone Story* (Boulder: Colorado Associated University Press, 1977, 1996), II, pp. 64-65.

¹⁸ John W. Meldrum in Joseph Joffe, "John W. Meldrum [The Grand Old Man of Yellowstone Park]," *Annals of Wyoming* 13 (April, 1941): 110. A bound, unpublished manuscript version of this long article is held in the YNP Research Library.

¹⁹ Joffe, "John W. Meldrum," pp. 110-111. The specifications to which Judge Meldrum referred: "Specifications for the construction of a store building, at Fort Yellowstone, Wyo., to be used as Jail, [and] Office for U.S. Commissioner, and residence for U.S. Marshal," no date, probably summer, 1894, Archive Document #1861, YNP Archives. The four single-spaced typewritten pages and were extremely specific as to walls, footings, mortar, exterior faces, exterior joints, cut stone, chimneys, lumber, studding, plastering, interior finish, iron work, wainscoting, and painting.

²⁰ Archive Documents #1857, 1858, undated, YNP Archives.

²¹ [F.J. Shaffer], "Memoranda of Sketch," no date, in Microfilm 2, Item 8, YNP Archives. Shaffer's description is quoted here in its entirety: "Top of cells to have two blocks of brick making height [sic] of cell from spring or arch windows in cells close up to cross [?] of arch ["thus," and here he included a small sketch.] 2x8 joist over cells for chamber floor[.] Cement floors in cells and corridor with drain gutter emptying into soil of kitchen sink with bell trap at outlet of drain[.] Steel grate bars for corridor and cell windows[.] Corridor window the same size as office[.] Steel flat barr[ed] doors for cells and door to office from corridor. Pannel [sic] door on office side[.] All steel doors to have frame securely anchored to stone work[.] You can arrange 4 chambers 1st story 9'—2nd story 8'6"[.] Soffite [sic—soffit] of stairs will show in jail corridor but will not injure it[.] You will find this manner of constructing cells cheaper than steel cells and it need[s] economy to reach your requirements [.]"

²² Archive Document #1857, no date, YNP Archives.

²³ Horace Albright, History Card File, "Commissioner's House," orange-tabbed cards in YNP Library wooden card-file.

²⁴ Joffe, "John W. Meldrum," p. 139. Meldrum left the park October 23, 1935 and died on February 27, 1936.

²⁵ John W. Meldrum to Richard Ulna, May 6, 1895; Gibson Clark to John Meldrum, June 11, 1895, both in Item 35, "John W. Meldrum, 1907-1908," YNP Archives.

²⁶ Note the 1976 study by Lance Williams (quoted below) that states that the Judge's house was "never...used as a jail because the guardhouse at Ft. Yellowstone was adequate for this purpose."

²⁷ Frank W. Mantel to E.A. Hitchcock, Secretary of Interior, December 5, 1899; Acting Secretary of Interior to John Meldrum, August 2, 1900; E.A. Hitchcock to Acting Superintendent of Yellowstone, July 11, 1901, all in Item 35, YNP Archives.

²⁸ Unaccepted bids opened January 11, 1909...for U.S. Commissioner's Office and Jail, in Item 100A, "Misc. Receipts, etc.," YNP Archives.

²⁹ "History Card File" under "Magistrate's House," YNP Library; Horace Albright, "Monthly Report of Superintendent" (bound volumes: YNP Library), August, 1922, p. 13; May, 1926, p. 6; July, 1926, p. 7; August, 1927, p. 5. *Calimine* or *kalsomine* is a typically white but sometimes tinted wash that is used mainly on plastered surfaces. It is made by mixing clear glue, whiting, or zinc white with water. In early Yellowstone days, silica mud from park thermal mud pots was sometimes added to the mix. For documentation of this use in early days, see Lee H. Whittlesey, "Music, Song, and Laughter: Yellowstone National Park's

Fountain Hotel, 1891-1916," *Montana, the Magazine of Western History* 53(Winter, 2003): 34n41. When informed of this fact, Judge Stephen Cole wondered aloud whether that was the reason that silica had been found on the floors and walls of his house. Author's telephone conversation with Stephen Cole, January 27, 2009. According to a newspaper article published at the time of the removal of jail cells, no prisoner had ever been housed in them during their entire thirty-two years of existence. "Yellowstone Jail Razed; Nary an Inmate in 32 Years," *Wisconsin (WI) Rapids Daily Tribune*, July 19, 1926, p. 7.

³⁰. National Park Service, Drawings 2084 (October 1, 1939) and 8243 (January 1, 1939) at <http://etic.nps.gov> Information Gateway, Denver, Colorado.

³¹. Photos 2G20 (1917) and 49-73 (1949) in box D-50, building 49, YNP archives.

³². Wohlbrandt's measurements must have somehow included the lot size, because his figure seems otherwise much too large. Stephen Cole says that the building has only about 1480 square feet on each floor.

³³. Philip H. Wohlbrandt, Historic Structures Report on building 49, September 20, 1949, in Cultural Resource Office, Yellowstone Center for Resources, Yellowstone National Park, Wyoming.

³⁴. Lance R. Williams, "Classified Structure Field Inventory Report," June 30, 1976, attached to Wohlbrandt, Structures Report on building 49, September 20, 1949, in volume 9 of white loose-leaf bindings, Cultural Resource Office, Yellowstone Center for Resources, Yellowstone National Park, Wyoming. The quoted report is David G. Battle and Erwin N. Thompson, *Fort Yellowstone Historic Structure Report* (Denver: National Park Service, May, 1972), pp. 276-277.

³⁵. Williams, "Classified Structure Field Inventory Report," pp. [2]-[3]. The word repainted appears to be a typo, repointed makes more sense. It was noted during the current condition investigation that there were several generations of repair to the mortar materials and, given the likelihood that the 1894-5 construction used pre-portland cement materials in the mortar, re-pointing would have been a periodic repair.

³⁶ This section authored by YNP Historian Lee H. Whittlesey, "The Judge's House": A History of the U.S. Commissioner's Residence at Mammoth Hot Springs, Yellowstone National Park, Wyoming. January 2009, YNP Archive.

³⁷. Whittlesey's telephone conversation with Stephen Cole, January 27, 2009.

CONDITION ASSESSMENT

Building materials were assessed on site in regard to their historic significance as well as their condition. A rating method and priority system has been used for assessing the condition of materials and is described as follows:

Materials Rating System

- 1 *Historic Material - Preserve (in place)*
- 2 *Historic Material - Preserve wherever possible; replace with in-kind*
- 3 *Historic Material - Preserve wherever possible; replace with compatible*
- 4 *Preserve where there is no reason for removal*
- 5 *Remove/alter/replace (sensitively)*
- 6 *Specified treatment not required*

Priority Rating System

Critical - Requires immediate action to preserve essential historic features and materials experiencing advanced deterioration, or to assure the stability of the building, or to preclude a threat to health or safety.

Serious - Materials or assemblies are approaching an advanced state of degradation, or will soon pose a threat to health or safety.

Minor - Degradation is minimal and preventative maintenance has not been followed; life expectancy of the material is reduced.

EVALUATION METHODOLOGY

- ❖ The building was measured with tape measures and hand held devices; measurements were compared with drawings that were retrieved from ETIC archives by Herbert Dawson NPS (see historic drawings section of this report).
- ❖ Existing materials on site were compared with the construction methods, materials, and technology in use at the time the Commissioner's house was constructed as understood and interpreted by architectural, engineering, and preservation disciplines.
- ❖ Historic documentation and significance of the structure was reviewed to provide a basis for

evaluation and to understand the importance of on-site materials, assemblies, and systems.

- ❖ The structure was photographed in its current condition.
- ❖ Visual observations of defects were made and incorporated into this report.
- ❖ Assemblies that have failed or are approaching failure were recorded photographically.
- ❖ Representative structural calculations were done for typical supporting members to confirm their adequacy for continued use. The building was evaluated for resistance to earthquake forces.
- ❖ Building codes were reviewed to assess safety for occupancy of the historic property.
- ❖ All documentation discovered while doing research for the facility was reviewed and incorporated in the preparation of this report.

HISTORIC BUILDING MATERIALS AND ASSEMBLIES

Site and Site Elements: The site that was selected for Fort Yellowstone is located on an elevated bench naturally sliced into an easterly facing sloped mountainside that looks outward to the northeast over the upper Yellowstone valley. Forested hillside continues upward from the west edge of the bench, and a steeply sloped hillside punctuated by coulees continues downward from the bench toward the east to terminate in the channel of the Gardiner River below. Mount Everts is directly across the river, resplendent with rocky crags and high altitude vegetation. Re-dedicated as the town of Mammoth, the site of the Fort remains as Park Headquarters for Yellowstone National Park, and evidence of military planning remains highly visible in the town.

The Mammoth Hot Springs geothermal feature occupies most of the upper western edge of the bench and extends to the south beyond the edge of the town site. The site of the U. S. Commissioner's House is at the northern end of the hot springs at

the mouth of Clematis Creek coulee. The east view from the house looks over the Grand Loop Road as it follows the edge of the hot springs feature, and beyond to the former military parade grounds. The site is gently sloped, has been graded for uniformity, and is manicured with introduced plantings and turf. The house is visually separated from the congested public roadway below by a pair of massive coniferous trees in the front lawn and it is accessed by a private drive between the hot springs and the house. A detached carriage house is located behind the house at the termination of the driveway. Although perimeter drainage is low-slope around north, east, and south sides of the building the slopes are positive and negative drainage problems were not noted. There is a potential for negative drainage to occur along the west side of the structure if additional surfacing materials are added to the private parking area behind the house.

Adjacent site features in the immediate proximity of the house and carriage house were not noted during the preparation of this report. Remnants of a stone foundation are located on the lot north of the site of the U. S. commissioner's House.

EXTERIOR MATERIALS

Concrete: Formed concrete was used for the window well at the north side of the house, the steps for the side entrance on the south elevation, a sidewalk across the west side of the structure, a u-shaped gutter located within the west one-half of the basement crawl space, and for the floor of the connected rear vestibule. The window well and south stoop are older generation materials; the sidewalk and vestibule floor are recent installations. The purpose of the gutter within the crawl space is not known. All concrete materials are in good condition.

Stone: The exterior walls of the U. S. Commissioner's House are all coursed cut stone that serve as structural bearing walls. Projecting window sills and structural lintels above openings are crafted from the same materials. The face of the exposed stone is split face and the corners of the stone blocks at openings and at the edge of the walls have been dressed. The source of the stone is attributed to be from a quarry visible in the hillside of Clematis Creek coulee west of the site of the house. Vertical coursing for the stone is approximately 9" and the lengths of individual stones vary from 14" to 20". The coursing pattern is

an informal running bond although not all vertical joints align in alternate courses. Coloration is predominantly grey-tan sandstone with occasional splotches of mauve, russet, and reddish ochre.

The condition of the individual stones is generally good and the structure conveys the sense of being plumb and level. However, there are numerous locations where the stones have separated and sizeable cracks have formed between adjacent stones. Since the stonework is the fundamental support for the structure and since the masonry is unreinforced, a preliminary seismic analysis was done as part of this report to determine an appropriate level of concern for the deficient stonework (see appendix B).

Results from that preliminary analysis indicate that the structure would experience damage in the event of an earthquake of a magnitude identified by the building codes, if the direction of the earthquake forces were in an east-west direction. Subject to further refinement, this conclusion suggests that **additional lateral resistance should be incorporated into the east-west walls of the house at the time repair of the stonework is initiated.** There are several ways that additional resistance could be incorporated; discussion of the repair of the stonework (including lateral resistance) is expanded in a separate section of this report.

Roofing Material: Roofing for the residence is relatively new and is sawn cedar shingles that are double coursed every fifth course. The use of wood shingles is consistent with original roof surfacing for the house. Roofing for the carriage house is also wood shingle (without accentuated coursing); **roofing for the carriage house is in extremely poor condition and it is recommended that it be replaced as soon as possible.**

Metal Gutters and Accessories: Historic profile half-round cavalry gutters are located along the east edge of the porch of the residence and at the drip edge of the shed roofs sheltering the wall dormers (only). Repair / selected replacement of these gutters is required; it is important that the historic profile be maintained.

Wrought Iron: A wrought iron foot scraper is located at the bottom of the front stairs serving the entrance porch.

Sheet Metal and Flashings: Exposed copper flashing is visible around the two brick chimneys penetrating the roof of the residence. It is appropriately step flashed and is in good condition. Sidewall flashing along the walls of the dormers is unknown. The carriage house roof does not incorporate any flashing.

Soffit Materials: The underside of the roof overhang at the perimeter of the residence is painted wood. The carriage house does not have a soffit since the rafter tails of the roof joists are exposed.

Roof Sheathing: The residence and the carriage house both have wood board sheathing below the roof surfacing.

Wood siding: The sidewalls of the roof dormers at the residence are clad with painted wood shingles, and all of the walls of the carriage house are clad with dropped wood siding (shiplap). All require repainting.

Fascia: The residence features a painted wood composite fascia with an ogee profile applied over a flat wood sub-fascia. The carriage house does not have a fascia along the eaves but does have a painted flat verge (or barge) board at the gable ends.

Wood trim boards: Frieze – The residence is adorned with a wide painted wood frieze board at the intersection of wall and soffit; it is trimmed with a cornice moulding at the change of plane. The carriage house has a painted siding width trim or frieze at the top of the wall surfacing.

Dormer windows – a pair of spaced wood trims cap the ends of all dormer sidewalls; the top of the sidewalls has a narrow flat painted wood trim at the juncture of the dormer shed roofs.

Carriage house openings – All openings at the carriage house are cased with flat painted wood 1x4 trims with butted corners.

Window & door casing at residence – These casings are original wood Victorian bulb-nose profiles in relatively good condition. It is important that these profiles be maintained.

Exterior doors: Main entrance door at residence – original (6) panel rail and stile wood door with a half lite installed in the second and third panel location

from the top. There is an original transom above the door and the bottom of the door lite is trimmed with classical dentils.

South door at residence – narrow wood rail and stile door similar to the primary entrance door. There is also a transom above this door.

Door between kitchen and rear vestibule – this was originally an exterior door; it is a painted wood rail and stile door with an upper lite; the upper lite has a subdivided band of smaller panes across the top and the bottom of the glazed area in the manner of cottage Victorian motifs.

Carriage house main entry door – original (4) panel (tall 2 panel over short 2 panel) painted wood rail and stile door with pronounced moldings at the perimeter of the beveled wood panels.

Carriage house rear passage door – wood plank utility door (sliding).

Carriage house vehicular door – wood plank utility door (sliding).

Exterior screen doors: (located at the front and side doors of the residence only) – Painted wood rail and stile doors with an upper divided lite (3 panes) over three recessed panels.

Windows: North, south, & east side of first floor of residence – all windows are 1/1 double hung original wood windows.

West side of first floor of residence – these are 1 lite wood windows; it is not known if these are operable windows.

Windows in wall dormers of second floor of residence – all windows are 1/1 double hung original wood windows.

Windows in shed dormers of second floor of residence – all windows are 1 lite inward swinging side hinged original wood windows.

Carriage house – (3) windows total; (1) in each gable end and (1) adjacent to main entry passage door. These are all 2/2 fixed 4 pane wood windows.

Storm windows: Storm windows are 1/1 painted wood units that match the meeting rail heights of the

double hung windows that they protect. A ventilation portal near the bottom of the windows is in the form of a shoelace (see photos).

Wood supports at the front entrance porch: The entrance porch is a hipped roof assembly supported by (6) 6x6 chamfered solid sawn wood columns and a continuous chamfered wood perimeter beam. The exposed roof joists and hip beams have also been chamfered. All supporting members are painted.

Brick masonry chimneys: The two chimneys serving the residence are symmetrically placed along the ridge line of the roof; they are made of smooth face salmon / terra cotta colored common brick installed with half running bond. The original mortar is installed with a struck joint.

Vestibule walls (new): The rear vestibule (attributed to 1999) is enclosed with contemporary wood stud framed walls. The exterior surfacing of the walls is painted plywood sheathing with a painted wood diagonal lattice texture applied over the basic wall surface (see photos).

INTERIOR MATERIALS (RESIDENCE)

It is known that the residence was impacted by a major project in 1999 and many of the interior surface materials date to that time; however, the application of the 1999 material was executed in a manner consistent with preservation ethics as we know them today, and the rehabilitated residence still conveys the integrity of location, design, setting, materials, workmanship, feeling, and association – as a residence. It is not known when the SW quadrant of the first floor experienced a change-in-use from a criminal justice activity to residential activity; other than the placement of windows in the west wall and the prominent side entryway there is no longer any visible evidence of the jail cells within the structure.

B1 Utility: Walls are predominantly painted plaster, the ceiling is textured GPDW, and the floor is concrete. Exposed steel support beams are visible in this space.

101 Dining: Exterior walls have been furred and are finished with painted GPDW and the west wall retains the historic built in china cabinetry and associated bead pattern wood wainscot. The floor is

hardwood (circa 1999) and is partially covered with an area carpet. The ceiling is painted GPDW.

102 Living/Study: Exterior walls have been furred and are finished with painted GPDW; the interior walls have been resurfaced with painted GPDW. The floor is hardwood (circa 1999) and is partially covered with an area carpet. The ceiling is painted GPDW.

103 Music Room (originally cells): The wall configuration that created the cells has been removed; the enlarged space has been finished similar to the Dining and Living / Study with GPDW walls, painted GPDW ceiling and hardwood flooring.

104 Bathroom/Utility Room: Walls and ceiling are painted GPDW and the floor is surfaced with resilient flooring (contemporary).

105 Kitchen: Walls and ceiling are painted GPDW and the floor is surfaced with resilient flooring (contemporary). The east wall features rehabilitated built – in cabinetry and a wainscot of historic bead pattern wood siding (painted). Other kitchen cabinets contained within the space are painted contemporary units.

106 Rear Vestibule: This Vestibule is new construction; interior finishes include GPDW walls and ceiling, concrete flooring, and painted flat wood trims, base, and casing.

201 Corridor/Upper Stairhouse: The walls and ceiling are painted GPDW; floor surfacing is carpet.

202 Southwest Bedroom: The walls, ceiling, and sloped underside of the roof (that is visible along the exterior wall line) are all painted GPDW. The floor is surfaced with carpeting.

203 Bathroom: The walls and ceiling are painted GPDW. Flooring for the space is resilient sheet vinyl that is bordered by a wide flat painted wood base. All plumbing fixtures are contemporary and the bathtub surround is pre-molded. A skylight admits natural light into the room (as a footnote the historic plans show a skylight for this space).

204 Northwest Bedroom: The walls, ceiling, and sloped underside of the roof (that is visible along the exterior wall line) are all painted GPDW. The floor is surfaced with carpeting.

205 Northeast Bedroom: The walls, ceiling, and sloped underside of the roof (that is visible along the exterior wall line) are all painted GPDW. The floor is surfaced with carpeting.

206 Southeast Bedroom: The walls, ceiling, and sloped underside of the roof (that is visible along the exterior wall line) are all painted GPDW. The floor is surfaced with carpeting.

With the exception of the width of Bathroom 203, it is noteworthy that all existing room configurations on the second floor level are identical to the arrangement indicated on the historic plans. Equally noteworthy, all doors, wood standing and running trim, transoms and exposed portions of hardware are attributed to be original.

Interior Doors:

Door 101B between the Kitchen and Dining: The original historic frame & trim remain; the door has been removed.

Door 102A: (into storage closet of the Living / Study space) TBD

Door 103B between Living/Study room and the Music room: TBD

Door 104A: (into Bathroom/Utility) this is a contemporary painted slab door.

Door 105A: See exterior door descriptions.

Door 106A: See exterior door descriptions.

Doors 201A, 201B, 202A, and 204A (bedroom entrance doors): All doors are original true rail and stile paneled doors with beveled panels. The pattern is a (4) panel configuration with the upper two panels significantly taller than the lower two panels. The doors are finished with a natural finish and feature an operable transom above.

Doors 202B, 202C, 204B, 204C, 205A, 205B, 206A, and 206B: (closet doors) Similar to the Bedroom entrance doors described in the paragraph above, All doors are original true rail and stile paneled doors with beveled panels. The pattern is a (4) panel configuration with the upper two panels significantly taller than the lower two panels.

Door 201C: (second floor bathroom) although the

interior of the bathroom is contemporary, the entry door into the space is consistent with all other doors on this level; it is a stained (4) panel original door with transom above.

Millwork: Millwork on the first floor level of the U. S. Commissioner's House includes:

Base – painted 3 piece wood base (wide).

Wainscot cap – shaped period molding (painted wood)

Door & window casing – wide shaped period molding of painted wood with label blocks at all pronounced corners. The pattern consists of a wide convex center, detailed linear beads at each side of the center, and the edges are narrow flat arises. Label blocks are square with a convex circular inset. Flat painted wood plinth blocks with a radiused top edge punctuate the bottom of door openings.

Millwork on the second floor level of the house is identical to the descriptions for the first floor above with the exception that all of the woodwork is finished naturally rather than painted.

Cabinetry: Cabinetry on the first floor of the house consists of the china cabinets along the west wall of the Dining Room, and the built – in storage units along the east wall of the Kitchen. The construction of this china closet feature is attributed to improvements made to the house in 1929. These units are back – to – back and feature glass upper doors within the units with bins / drawers below. The remaining Kitchen cabinets, book shelving in the Living Room / Study, and storage cabinets at the south end of the corridor connecting the Kitchen and Utility area have all been introduced.

The second floor cabinetry consists of built – in dresser drawers between the bedroom closets and below the roof dormers facing north and south from the (4) bedrooms respectively. It is original, the cabinetry faces have been painted to match the walls of the rooms, and (with the exception of room 202) have natural wood tops and aprons.

Interior Stairs: Interior stairway between the first and second floors: this is a wood stair with a carpet runner applied above articulated wood treads and risers, and a balustrade wood handrail. The protective handrail consists of closely spaced and turned balusters, a shaped wood railing, solid wood newel posts at the end of the stairs and at changes in direction, and large round wood finials adorning the

top of the newel posts.

Interior stairway between the first floor and basement utility space: this stair is a utilitarian stair with wood stringers, wood painted plank treads, and open risers. The railing is a shaped and painted 2x4 affixed to the upper north wall and wood post at the bottom of the stair.

Hardware: Except for observations as noted above, hardware for doors and windows was not inventoried. Generally, the hardware appeared to be in good condition and some of the patterns embossed on the hinges and roses are visually appealing and period appropriate. **It is recommended that the hardware for the facility be inventoried.**

Mechanical: Baseboard heating units were the only visible indication of a heating system for the facility and their installation was limited to the first floor. Water service coming into the east crawl space is copper and based on the date of the major rehabilitation the water distribution in the house is also likely copper. Waste and vent systems within the structure is predominantly PVC and is attributed to the 1999 rehabilitation work. A radon forced ventilation system can be seen in the utility room of the basement. A dryer vent exhaust grille exits from the face of the north dutch hip, and bathroom exhaust ventilation exits from the north chimney on the roof (no longer used as a chimney). A class ABC fire extinguisher is mounted within the lower stair; automatic fire suppression systems (sprinklers) were not observed in the facility.

Electrical: It is assumed that electrical systems were investigated, replaced where required, and brought up to current standards at the time of the 1999 major rehabilitation project. Smoke /fire detection monitors were noted throughout the house.

With the exception of the Tack Room, the interior of the Carriage House is comprised entirely of exposed wood structure. The walls and ceilings of the Tack Room are surfaced with lapped wood siding (natural finish). The sliding door track and related hangars are noteworthy in this structure (see photos).

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
SITE								
Site		Site Landscaping	(2) large conifers at front (east side) of house		4	natural	No Rqmt	X
			(1) large conifer at NW corner of house		4	natural	No Rqmt	X
			Selected foundation plantings along north wall		4	domestic	No Rqmt	X
			Informal flower grouping near south entrance		3	domestic	No Rqmt	X
		Stone foundation (not part of property)	A stone foundation exists north of the house		NIC			
Site		Driveway	Unbordered asphalt south of residence		4	Fair	Minor	X
Site		Site Grading	Gentle slope from terraces to parade ground		4	Good	Minor	X
			Potential for neg drainage at west side		5	Poor	Serious	X
Site		Site turf	Introduced lawn around perimeter of house		4	good	Minor	X
Site		Site - Paths and walks	Concrete walk from east to primary entrance		2	Fair	Minor	X
			Concrete walk from kitchen vestibule to S cor.		4	Good	No Rqmt	X
			3 step conc stoop at south door		2	Fair	Minor	X
			Conc pad for garbage near back door		4	Good	No Rqmt	X
			Gravel pad for car storage across back		5	Poor	Serious	X
Site		Manholes	Unidentified metal container w of back door		TBD			
Site		Window wells	Conc wdw well at north wall (2 wdws wide)		1	Fair	Minor	X

ROOF ASSEMBLY

Roof	Roof surfacing	Wd shingle; stepped application	4	Good	No Rqmt	
Roof	Ridges	Wd shingle	4	Good	No Rqmt	
Roof	Flashing	Stepped copper at chimneys	2	Good	No Rqmt	
Roof	Sheathing	3/4" wd boards - S2S	2	Fair	minor	
Roof	Insulation - See Ceiling	Blown in cellulose	4	Good	minor	
Roof	Fascia	1x flat backboard	2	Fair	minor	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
Roof		Fascia	Ogee edge moulding		1	Fair to poor	minor	
Roof		Soffit	1x flat wood; mitered corners		2	Fair to poor	minor	
Roof		Soffit trim at wall intersection	Articulated classical moulding		1	Good	minor	
Roof		Frieze Board	1x wd; flat, painted		2	Fair	minor	
Roof		Returns at wall dormers (pents)	Wd siding w/ wd trims & casings		1	Fair	minor	

CHIMNEYS

Roof chimneys		Brick masonry chimneys	Commons, 1/2 running bond, smooth, salmon		1	Good	No Rqmt	
	N chimney	Chimney cap & vent	Galvanized iron		4	Good	No Rqmt	

DORMERS

Wall dormers	(2)@E:(2)@W	Shed roofs	MTs & details same as primary roof		2	Good	No Rqmt	
		Sidewalls	Wd siding w/ wd trims & casings		1	Fair	minor	
	See separate tabulation for windows							
Roof dormers	(2)@N:(2)@S	Shed roofs	MTs & details same as primary roof		2	Good	No Rqmt	
		Sidewalls	Wd siding w/ wd trims & casings		1	Fair	minor	
	See separate tabulation for windows							

CUT STONE BEARING WALLS

East Wall		Coursed stone	Locally Quarried stone		1	Fair	Serious	
		Dressed Corners	Locally Quarried stone		1	Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone		1	Fair	minor	
		Stone lintels over openings	Locally Quarried stone		1	Good	minor	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
South Wall	See separate tabulation for doors, windows, and domers	Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Poor	Critical	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	
		Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Poor	Critical	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	
West Wall	See separate tabulation for doors, windows, and domers	Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Poor	Critical	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	
		Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Fair	Serious	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	
North Wall	See separate tabulation for doors, windows, and domers	Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Fair	Serious	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	
		Perimeter sealants	Various materials	5		Poor	Serious	
		Coursed stone	Locally Quarried stone	1		Fair	Serious	
		Dressed Corners	Locally Quarried stone	1		Good	No Rqmt	
		Smooth stone window sills	Locally Quarried stone	1		Fair	minor	
		Stone lintels over openings	Locally Quarried stone	1		Good	minor	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
WEST VESTIBULE								
Roof		Surfacing	Wd shingle	4		Good	minor	
		Sheathing	Plywood	4		Good	minor	
		Fascia	1x wd - flat w/o trim	4		Good	minor	
		Soffit	Narrow wd trim	4		Good	minor	
Exterior walls		Structure	Wd frame	4		Good	minor	
		Surfacing	Ext pwd w/ corner boards	4		Good	minor	
		Trim	Applied lattice-work	4		Good	minor	
		Conc curb at grade	Conc slab-on-grade	4		Good	minor	
FOUNDATION								
EAST ENTRANCE PORCH								
Roof		Surfacing	Wd shingle	4		Good	minor	
		Sheathing	3/4" T&G w/ beveled center accent	2		Fair	minor	
		Fascia	3/4" wd; cladding for perimeter beam	1		Fair	minor	
		Soffit	Exposed sheathing	2		Fair	minor	
Supports		Ceiling below	Exposed sheathing & chamfered joists	2		Fair	minor	
		Wd columns	solid sawn 6x6 w/ chamfered corners	1		Fair	minor	
		Wood; oriented E-W	1x4 T&G	3		Poor	Serious	
		Wd joist framing	Size unknown	2		TBD	TBD	
Floor structure		Cut stone piers at corners; & at front	Locally Quarried stone	1				
Supports / piers		Lattice screen	Wd w/ 1x4 frame & diagonal wd pattern	5		Poor	Critical	
		1x wood treads 7 risers	eased edges	2		Fair	minor	
Deck enclosure		Iron; embedded in concrete	Period wrought iron	1		Fair	minor	
Steps								
Foot scraper								

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
EXTERIOR WINDOWS								
	Skylight; 2nd bath	Roof mounted skylight	Contemporary plexiglass	1	4	Good	minor	
	2nd BR; E & W	Double hung operating windows	Original wd sash, frames, and hardware	4	1	Fair	Serious	
	2nd BR; N & S	Side hinged; inward swinging	3-lite original wd sash, frames, & hardware	4	1	Fair	Serious	
	Rm 101	Double hung operating windows	Original wd sash, frames, and hardware	2	1	Fair	Serious	
	Rm 102; study	Double hung operating windows	Original wd sash, frames, and hardware	2	1	Fair	Serious	
	Rm 103 - south	Double hung operating windows	Original wd sash, frames, and hardware	1	1	Fair	Serious	
	Rm 103 - West	Side hinged; inward swinging	1-lite original wd sash, frames, & hardware	2	1	Fair	Serious	
	Rm 104; util/bath	Side hinged; inward swinging	1-lite original wd sash, frames, & hardware	1	1	Fair	Serious	
	Rm 105; kitchen	Double hung operating windows	Original wd sash, frames, and hardware	2	1	Fair	Serious	
	Rm 106; vest Ext wdw casing	Fixed lite in west wall (behind screen)	Wd; contemporary	1	4	Good	No Rqmt	
	All ex. Vest Ext wdw casing	Wood (original)	Victorian bullnose casing (see drawings)	1	1	Fair	Serious	
	Vestibule	Wd 1x4; flat	Mitered corners	4	4	Good	No Rqmt	
EXTERIOR DOORS								
	101A; main entry	Original wd pnl stile & rail door	1/2 lite w/ 3 pnls below & 1 pnl above; dentils	1	1	Fair	minor	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
103A; side entry		Original wd pnl stile & rail door	1/2 lite w/ 3 pnls below & 1 pnl above; dentils	1	1	Fair	Serious	
105A; kitchen		Original wd pnl stile & rail door	3 panel w/ decorative lite above (sm panes)	1	1	Fair	minor	
106A; W. vest		Contemporary wd pnl stile & rail door	3 panel door w/ 1/2 lite above	1	4	Good	No Rqmt	
Ext door casing		Wood (original)	Victorian bullnose casing (see drawings)		1	Fair	minor	
Hardware		Original @ 101 & 103; new @ 105 & 106	Mortise @ 101 & 103; cyl @ 105 & 106	2	2	Fair	minor	
Screen doors		Wd panel w/ 1/2 lite	Date unknown; perofod appropriate	2	2,5	Fair	minor	

FOUNDATION

South 2/3	Stone; uncoursed	depth unknown	1	TBD	TBD	
North 1/3	Stone; uncoursed; furred out	full story height	1	TBD	TBD	

INTERIOR

CRAWL SPACE-WEST

Interior	Ceiling	Exposed wood framing	3	Good	minor	
	N. Wall	Exposed stone	1	Fair	TBD	
	E. Wall	Exposed stone	1	Fair	TBD	
	W. Wall	Exposed stone	1	Fair	TBD	
	S. Wall	Exposed stone	1	Fair	TBD	
	Base	None				
	Flooring	None; concrete trench runs N-S in center				
	Door(s)	AP (only) in N wall				
	Casing & Trims	None				
	Vapor Barrier	None				

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
CRAWL SPACE-EAST Interior		Ceiling Insulation	Various	4	4	Varied	minor	
		Ceiling	Exposed wood framing	3	3	Good	minor	
		N. Wall	Exposed stone	1	1	Fair	TBD	
		E. Wall	Exposed stone	1	1	Fair	TBD	
		W. Wall	Exposed stone	1	1	Fair	TBD	
		S. Wall	Exposed stone	1	1	Fair	TBD	
		Base	None			Fair	TBD	
		Flooring	None					
		Door(s)	AP (only) in N wall					
		Casing & Trims	None					
B1 - UTILITY Interior		Vapor Barrier	None					
		Ceiling Insulation	Various	4	4	Varied	minor	
		Ceiling	Painted plaster	3	3	Good	minor	
		N. Wall	Painted plaster	2	2	Good	minor	
		E. Wall	Painted plaster	2	2	Good	minor	
		W. Wall	Painted plaster	2	2	Good	minor	
		S. Wall	Painted plaster	2	2	Good	minor	
		Base	None					
		Flooring	Concrete-pld	5	5	Good	minor	
101-DINING / LIVING Interior		Ceiling	GPDW	4	4	Good	No Rqmt	
		N. Wall	Furred GPDW	4	4	Good	No Rqmt	
		E. Wall	Furred GPDW	4	4	Good	No Rqmt	
		W. Wall	Painted Plaster	2	2	Good	No Rqmt	
		S. Wall	Painted Plaster	2	2	Good	No Rqmt	
		Window and door casing	Period wood mouldings w/ label blocks	1	1	Good	No Rqmt	
		Mouldings	Period wood mouldings	1	1	Good	No Rqmt	
		Base	3 piece wide base (period)	1	1	Good	No Rqmt	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
102-LIVING / STUDY Interior		Flooring	Hdwd w/ area carpet	4		Good	No Rqmt	
		Cabinetry	Built-in (original) china buffet w/ wd pat int	1		Good	No Rqmt	
		Ceiling	GPDW	4		Good	No Rqmt	
		N. Wall	Painted plaster	2		Good	No Rqmt	
		E. Wall	Furred GPDW	4		Good	No Rqmt	
		W. Wall	Painted Plaster	2		Good	No Rqmt	
		S. Wall	Furred GPDW	4		Good	No Rqmt	
		Window and door casing	Period wood mouldings w/ label blocks	1		Good	No Rqmt	
		Mouldings	Period wood mouldings	1		Good	No Rqmt	
		Base	3 piece wide base (period)	1		Good	No Rqmt	
		Flooring	Hdwd w/ area carpet	4		Good	No Rqmt	
		Cabinetry	Contemporary wd pld bookshelves	4		Good	No Rqmt	
		Stair newel post	Ptd solid wood w/ ball finial	1		Good	No Rqmt	
		Stair handrail	Shaped pld wd	1		Good	No Rqmt	
		Stair bannister	Turned wd vertical spindles	1		Good	No Rqmt	
		Stair treads and risers	Carpet (contemporary)	1		Good	No Rqmt	
103-MUSIC ROOM Interior		Ceiling	GPDW	4		Good	No Rqmt	
		N. Wall	GPDW	4		Good	No Rqmt	
		E. Wall	Painted Plaster	2		Good	No Rqmt	
		W. Wall	Furred GPDW	4		Good	No Rqmt	
		S. Wall	Furred GPDW	4		Good	No Rqmt	
		Window and door casing	Period wood mouldings w/ label blocks	1		Good	No Rqmt	
		Mouldings	Period wood mouldings	1		Good	No Rqmt	
		Base	3 piece wide base (period)	1		Good	No Rqmt	
		Flooring	Hdwd	4		Good	No Rqmt	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
104-UTILITY / BATHROOM	Interior	Cabinetry	None					
		Ceiling	GPDW	4	4	Good	No Rqmt	
		N. Wall	GPDW	4	4	Good	No Rqmt	
		E. Wall	GPDW	4	4	Good	No Rqmt	
		W. Wall	GPDW	4	4	Good	No Rqmt	
		S. Wall	GPDW	4	4	Good	No Rqmt	
105-KITCHEN	Interior	Window and door casing	Mouldings to match original	4	4	Good	No Rqmt	
		Mouldings	None					
		Base	Match profiles remainder of 1st fl	4	4	Good	No Rqmt	
		Flooring	Resilient tile	4	4	Good	No Rqmt	
		Cabinetry	Contemporary sink base (p/d)	4	4	Good	No Rqmt	
		Ceiling	GPDW	4	4	Good	No Rqmt	
		N. Wall	Furred GPDW	4	4	Good	No Rqmt	
		E. Wall	Painted Plaster w/ bead pattern wd wainscot	1	1	Good	No Rqmt	
		W. Wall	Furred GPDW	4	4	Good	No Rqmt	
		S. Wall	GPDW	4	4	Good	No Rqmt	
201-STAIRHALL	Interior	Window casing	None					
		Door casing	Match profiles remainder of 1st fl	4	4	Good	No Rqmt	
		Base	Match profiles remainder of 1st fl	4	4	Good	No Rqmt	
		Flooring	Resilient tile	4	4	Good	No Rqmt	
		Cabinetry	P/d wd contemporary base & wall units	4	4	Good	No Rqmt	
		Ceiling	P/d GPDW / Plaster	3	3	Good	No Rqmt	
		N. Wall	P/d GPDW / Plaster	3	3	Good	No Rqmt	
		E. Wall	P/d GPDW / Plaster	3	3	Good	No Rqmt	
		W. Wall	P/d GPDW / Plaster	3	3	Good	No Rqmt	
		S. Wall	P/d GPDW / Plaster	3	3	Good	No Rqmt	
		Door casing	Period wood mouldings w/ label blocks	1	1	Good	No Rqmt	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
202-SW BEDROOM Interior		Base	3 piece wide base (period)		1	Good	No Rqmt	
		Flooring	Carpet (contemporary)		4	Good	No Rqmt	
		Stair newel post	Nat solid wood w/ ball finial		1	Good	No Rqmt	
		Stair handrail	Shaped stained wd		1	Good	No Rqmt	
		Stair bannister	Turned wd vertical spindles (stained)		1	Good	No Rqmt	
		Ceiling	Ptd GPDW / Plaster		3	Good	No Rqmt	
		N. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		E. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		W. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		S. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
203-BATHROOM Interior		Window casing	Period wd moldings w/ label blocks, sills, aprons		1	Good	No Rqmt	
		Door casing	Period wood mouldings w/ label blocks		1	Good	No Rqmt	
		Base	3 piece wide base (period)		1	Good	No Rqmt	
		Flooring	Carpet		4	Good	No Rqmt	
		Built-in closets	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Closet doors	2 over 2 wd rail & stile (stained)		1	Good	No Rqmt	
		Ceiling	Ptd GPDW / Plaster		4	Good	No Rqmt	
		N. Wall	Ptd GPDW / Plaster		4	Good	No Rqmt	
		E. Wall	Ptd GPDW / Plaster		4	Good	No Rqmt	
		W. Wall	Ptd GPDW / Plaster		4	Good	No Rqmt	
204-NW BEDROOM Interior		S. Wall	Ptd GPDW / Plaster		4	Good	No Rqmt	
		Door casing	Contemporary ptd wood		4	Good	No Rqmt	
		Base	1x8 flat ptd wood		4	Good	No Rqmt	
		Flooring	Resilient sheet vinyl		4	Good	No Rqmt	
		Cabinetry	Contemporary sink base		4	Good	No Rqmt	
		Ceiling	Ptd GPDW / Plaster		3	Good	No Rqmt	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
		N. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		E. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		W. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		S. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Window casing	Period wd midngs w/ label blocks, sills, aprons		1	Good	No Rqmt	
		Door casing	Period wood mouldings w/ label blocks		1	Good	No Rqmt	
		Base	3 piece wide base (period)		1	Good	No Rqmt	
		Flooring	Carpet		4	Good	No Rqmt	
		Built-in closets	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Closet doors	2 over 2 wd rail & stile (stained)		1	Good	No Rqmt	
205-NE BEDROOM								
Interior		Ceiling	Ptd GPDW / Plaster		3	Good	No Rqmt	
		N. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		E. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		W. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		S. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Window casing	Period wd midngs w/ label blocks, sills, aprons		1	Good	No Rqmt	
		Door casing	Period wood mouldings w/ label blocks		1	Good	No Rqmt	
		Base	3 piece wide base (period)		1	Good	No Rqmt	
		Flooring	Carpet		4	Good	No Rqmt	
		Built-in closets	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Closet doors	2 over 2 wd rail & stile (stained)		1	Good	No Rqmt	
206-SE BEDROOM								
Interior		Ceiling	Ptd GPDW / Plaster		3	Good	No Rqmt	
		N. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		E. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		W. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		S. Wall	Ptd GPDW / Plaster		3	Good	No Rqmt	
		Window casing	Period wd midngs w/ label blocks, sills, aprons		1	Good	No Rqmt	

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
		Door casing	Period wood moldings w/ label blocks	1	1	Good	No Rqmt	
		Base	3 piece wide base (period)	1	1	Good	No Rqmt	
		Flooring	Carpet	4	4	Good	No Rqmt	
		Built-in closets	Pld GPDW / Plaster	3	3	Good	No Rqmt	
		Closet doors	2 over 2 wd rail & stile (stained)	1	1	Good	No Rqmt	
INTERIOR DOORS								
	101B		Opening only; door has been removed	1	1	Good	No Rqmt	
	103B		Opening only; door has been removed	1	1	Good	No Rqmt	
	104A		Contemporary pld slab door	4	4	Good	No Rqmt	
	210A		2/2 pnl stained rail & stile w/ operable transom	1	1	Good	No Rqmt	
	201B		2/2 pnl stained rail & stile w/ operable transom	1	1	Good	No Rqmt	
	201C		2/2 pnl stained rail & stile w/ operable transom	1	1	Good	No Rqmt	
	202A		2/2 pnl stained rail & stile w/ operable transom	1	1	Good	No Rqmt	
	204A		2/2 pnl stained rail & stile w/ operable transom	1	1	Good	No Rqmt	
	Bi-fold storage doors; Rm 105 corridor		Contemporary pld wd pnl doors	4	4	Good	No Rqmt	
	Closet doors are described within respective rooms							

LATERAL FORCE RESISTING SYSTEM

Structure	Stone bearing walls	(See Structural Commentary)	1	Varied	Critical
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HARDWARE

Int-2nd fl Bdms	Hinges; latchset; transom rod	Original; mortise lock	1	Fair	minor
	Hinges; latchset	Contemporary	5	Good	No Rqmt
Int-1st fl BR					

MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
Int-2nd fl BR		Hinges; latchset; transom rod	Original; mortise lock	1		Fair	minor	
Int-2nd fl Clos		Hinges; latchset	Original; mortise latch	1		Fair	minor	
Int-101 to 105		Hinges only	Original	1		Fair	minor	
Int - 102 to 103		Hinges only	Original	1		Fair	minor	
Int-101 china		Hinges; bin pulls, catch	Original or compatible	1		Fair	minor	
Int - 105 china		Hinges; bin pulls, catch	Original or compatible	1		Fair	minor	
Int-windows	Dbl hung	Sash locks; rope, pulley	Original or compatible	1		Fair	minor	
Int-windows	Casement	Hinges; catch	Original	1		Fair	minor	

MECHANICAL

Mech	Fixture vents	Various	Introduced	5		Good	No Rqmt	
	Waste	Unknown	Not evaluated					
	Water supply	Copper	Not evaluated					
	Heat	Elec baseboard / unknown	Contemporary	5		Good	No Rqmt	
	Radon vent	Fan and ductwork	Contemporary	5		Good	No Rqmt	
	Dryer vent	Galvanized iron	Contemporary	5		Good	No Rqmt	

ELECTRICAL

Elec	Service	Underground - unknown	Not evaluated	TBD		Good	No Rqmt	
	Distribution	Lighting & Power	Contemporary	3,4		Good	No Rqmt	
	Fixtures	Period appropriate						

SECURITY

Security	Security system	None						
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MATERIALS INVENTORY - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY	COMP
FIRE DETECTION / EXTINGUISHING SYSTEMS								
Fire		Fire/smoke		5				
		Detection	Cig mounted detectors					
		Fire Alarm	None noted					
		Fire Extinguishers	None noted					

ERRATTA

Ext satellite dishes

MATERIALS INVENTORY - Carriage / Livery / Garage

SITE CAT LOCATION ELEMENT DESCRIPTION QTY RTG COND PRIORITY

See material inventory of U. S. Commissioner's House for site descriptions and tabulations

ROOF ASSEMBLY

Roof	Roof surfacing	Wd shingle (or missing)	3	Very Poor	Critical
Roof	Ridges	1x wd ridge (or missing)	3	Very Poor	Critical
Roof	Sheathing	3/4" wd boards - S2S	2	Fair	TBD
Roof	Fascia	None			
Roof	Soffit	Exposed rafter tails	2	Fair	minor
Roof	Frieze Board	1x wd; flat, painted	2	Fair	minor

EXTERIOR WALLS

East Wall	Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor
	Corner boards	1x4 flat wd; pld	2	Fair	minor
	Perimeter sealants	Various materials	5	Poor	Serious
South Wall	See separate tabulation for doors and windows				
	Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor
	Corner boards	1x4 flat wd; pld	2	Fair	minor
West Wall	See separate tabulation for doors and windows				
	Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor
	Corner boards	1x4 flat wd; pld	2	Fair	minor
North Wall	See separate tabulation for doors and windows				
	Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor
	Corner boards	1x4 flat wd; pld	2	Fair	minor

See separate tabulation for doors and windows

MATERIALS INVENTORY - Carriage / Livery / Garage

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY
EXTERIOR WINDOWS							
E wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	1	2	Poor	Critical
S wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	1	2	Poor	Critical
N wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	1	2	Poor	Critical
Ext wdw casing	All	Wd 1x4; flat	Butted comers; projecting sill; no apron		2	Fair	minor
EXTERIOR DOORS							
E. entrance		4 pnl wd (2/2) wd door	True rail and stile w/ molded stops (original)	1	1	Poor	Serious
W. passage		wd plank sliding door	Oversize for animal passage	1	1	Fair to poor	Serious
E. equipment dr		wd plank sliding door	9' door for vehicles or animals; iron track	1	1	Fair to poor	Serious
W. hatch		wd plank hatch at grade	Cleaning access (original)	1	1	Poor	Serious
Ext dr casing	All	Wd 1x4; flat	Butted comers		2	Fair	minor
FOUNDATION							
Foundation		Perimeter	Unknown (may be timbers)		5	TBD	Critical
INTERIOR							
CARRIAGE STORAGE G-1							
Interior		Ceiling	Exposed rafters and sheathing (natural)		2	Good	minor
		N. Wall	Exposed wood studs and sheathing (natural)		2	Good	minor
		E. Wall	Exposed wood studs and sheathing (natural)		2	Good	minor
		W. Wall	Exposed wood studs and sheathing (natural)		2	Good	minor
		S. Wall	Partition w/ wd siding finish (natural)		2	Good	minor
		Base	None				
		Flooring	Wood planking		2	Fair	minor
		Door(s)	See exterior doors & rm G-2 below				
		Casing & Trims	Flat 1x4 wd @ door to Tack Room		2	Good	minor

MATERIALS INVENTORY - Carriage / Livery / Garage

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY
TACK ROOM G-2	Interior	Vapor Barrier	None				
		Insulation	None				
		Ceiling	Ceiling joists w/ wd siding over (natural)	2	2	Good	minor
		N. Wall	Wood siding (horizontal) - natural finish	2	2	Good	minor
		E. Wall	Wood siding (horizontal) - natural finish	2	2	Good	minor
		W. Wall	Wood siding (horizontal) - natural finish	2	2	Good	minor
		S. Wall	Wood siding (horizontal) - natural finish	2	2	Good	minor
		Base	None				
		Flooring	Wood planking	2	2	Fair	minor
		Door(s)	See exterior doors				
		Door(s) - passage into Carriage space	True rail and stile w/ molded stops (original)	1	1	Fair	minor
		Casing & Trims	Flat 1x4 wd @ door to Tack Room	2	2	Good	minor
		Vapor Barrier	None				
STALL G-3	Interior	Insulation	None				
		Ceiling	Exposed rafters and sheathing (natural)	2	2	Good	minor
		N. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		E. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		W. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		S. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		Base	None				
		Flooring	Wood planking	2	2	Fair	minor
		Door(s)	Wood gate only	2	2	Good	minor
		Casing & Trims	None				
		Vapor Barrier	None				
		Insulation	None				
		Ceiling	Exposed rafters and sheathing (natural)	2	2	Good	minor
STALL / FEED (ADJ TO G-3)	Interior	N. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
			Exposed wood studs and sheathing (natural)	2	2	Good	minor

MATERIALS INVENTORY - Carriage / Livery / Garage

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY
		E. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		W. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		S. Wall	Exposed wood studs and sheathing (natural)	2	2	Good	minor
		Base	None				
		Flooring	Wood planking		2	Fair	minor
		Door(s)	See exterior doors				
		Door(s)	Wood gate only		2	Good	minor
		Casing & Trims	None				
		Vapor Barrier	None				
		Insulation	None				

LATERAL FORCE RESISTING SYSTEM

(See Structural Commentary)

HARDWARE

Structure	Stone bearing walls	
Int-2nd fl Bdrms	Hinges; latchset; transom rod	Original; mortise lock
Int-1st fl BR	Hinges; latchset	Contemporary
Int-2nd fl BR	Hinges; latchset; transom rod	Original; mortise lock
Int-2nd fl Clos	Hinges; latchset	Original; mortise latch
Int-101 to 105	Hinges only	Original
Int - 102 to 103	Hinges only	Original
Int-101 china	Hinges; bin pulls, catch	Original or compatible
Int -105 china	Hinges; bin pulls, catch	Original or compatible
Int-windows	Sash locks; rope; pulley	Original or compatible
Int-windows	Hinges; catch	Original

MECHANICAL

Mech	Fixture vents	Various	Introduced
	Waste	Unknown	Not evaluated

MATERIALS INVENTORY - Carriage / Livery / Garage

CAT	LOCATION	ELEMENT	DESCRIPTION	QTY	RTG	COND	PRIORITY
ELECTRICAL	Water supply	Copper	Not evaluated				
	Heat	Elec baseboard / unknown	Contemporary				
	Radon vent	Fan and ductwork	Contemporary				
	Dryer vent	Galvanized iron	Contemporary				
	Service Distribution	Underground - unknown Lighting & Power	Not evaluated Contemporary				
SECURITY	Security	Security system	None				
	FIRE DETECTION / EXTINGUISHING SYSTEMS						
Fire		Fire/smoke Detection	Clg mounted detectors				
		Fire Alarm	None noted				
		Fire Extinguishers	None noted				

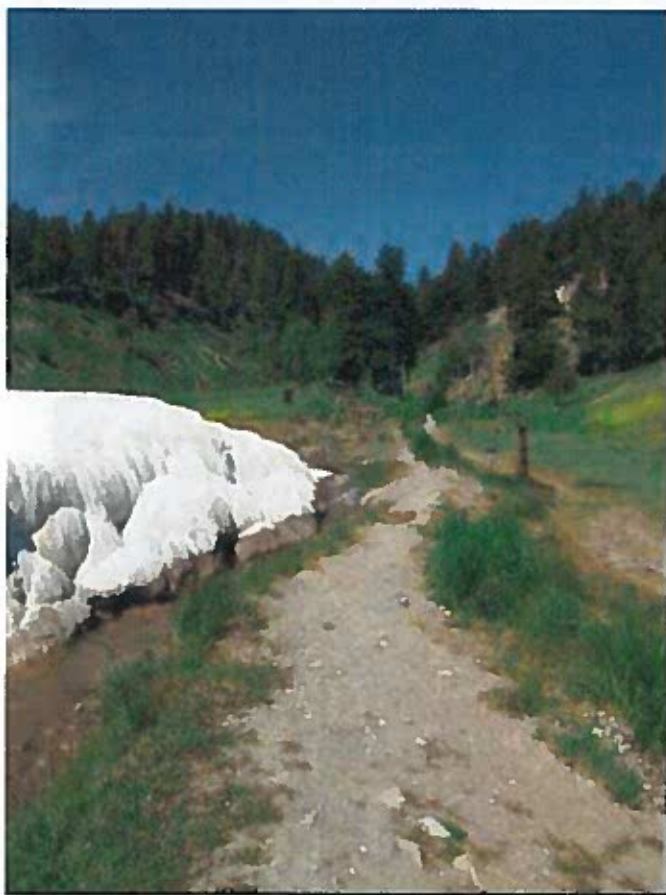
ERRATA

Ext satellite dishes

CURRENT PHOTOGRAPHS



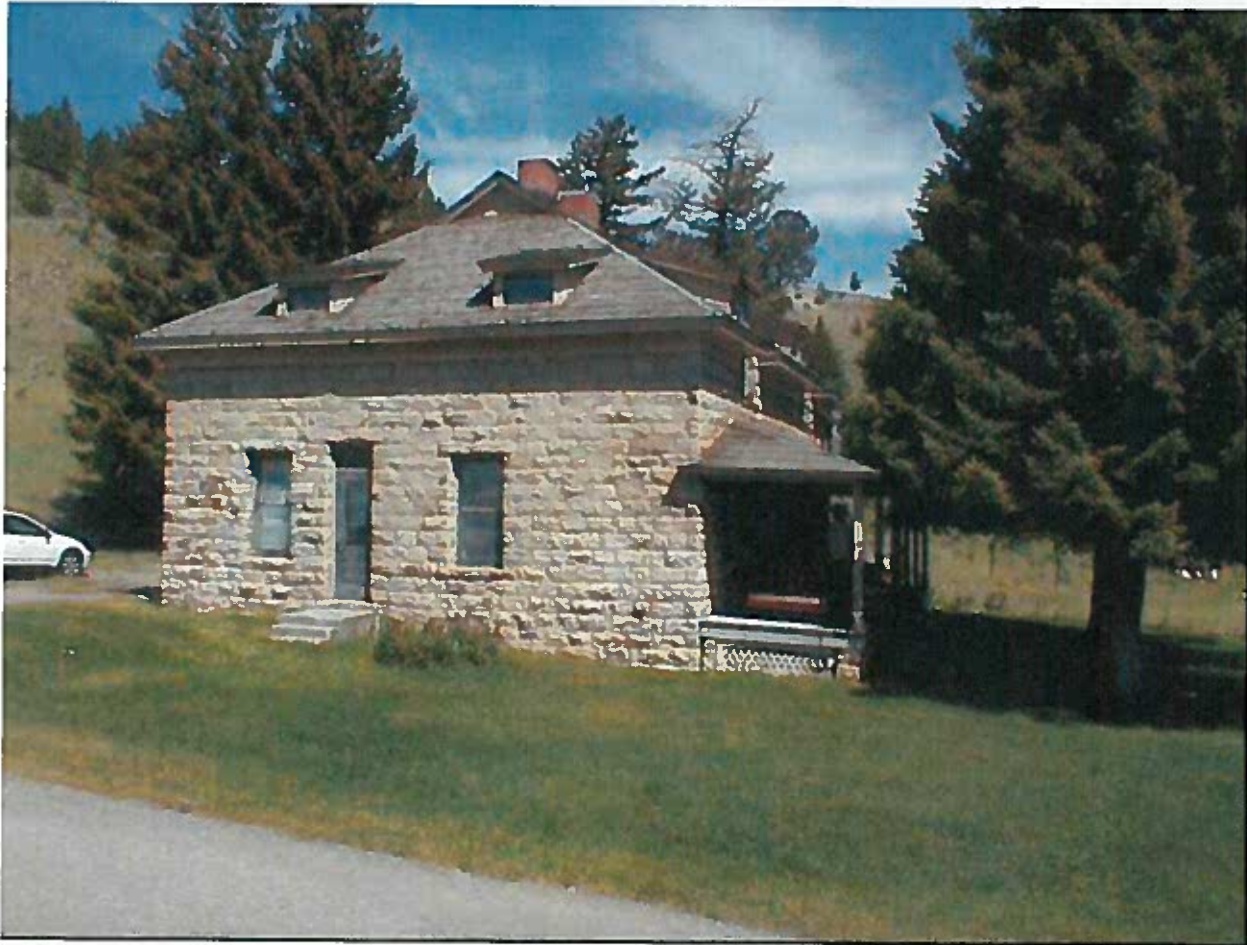
View of Mammoth Terraces from the back yard of the U. S. Commissioner's House. Photo Credit: Herb Dawson, NPS.



View of trail and terraces at ravine behind the U. S. Commissioner's House. Hillside at upper right of photo is believed to be the source of stone utilized in the construction of the house. Photo Credit: Herb Dawson, NPS.



Closer view of hillside quarry. Photo Credit: Ken Sievert.



Overall view of the U. S. Commissioner's House from the SouthEast. Note the extensive use of stone. The roof features a 'Dutch Hip' (small gable wall near the ridge line) and the roof is penetrated by two symmetrical brick masonry chimneys. Photo Credit: Ken Sievert.



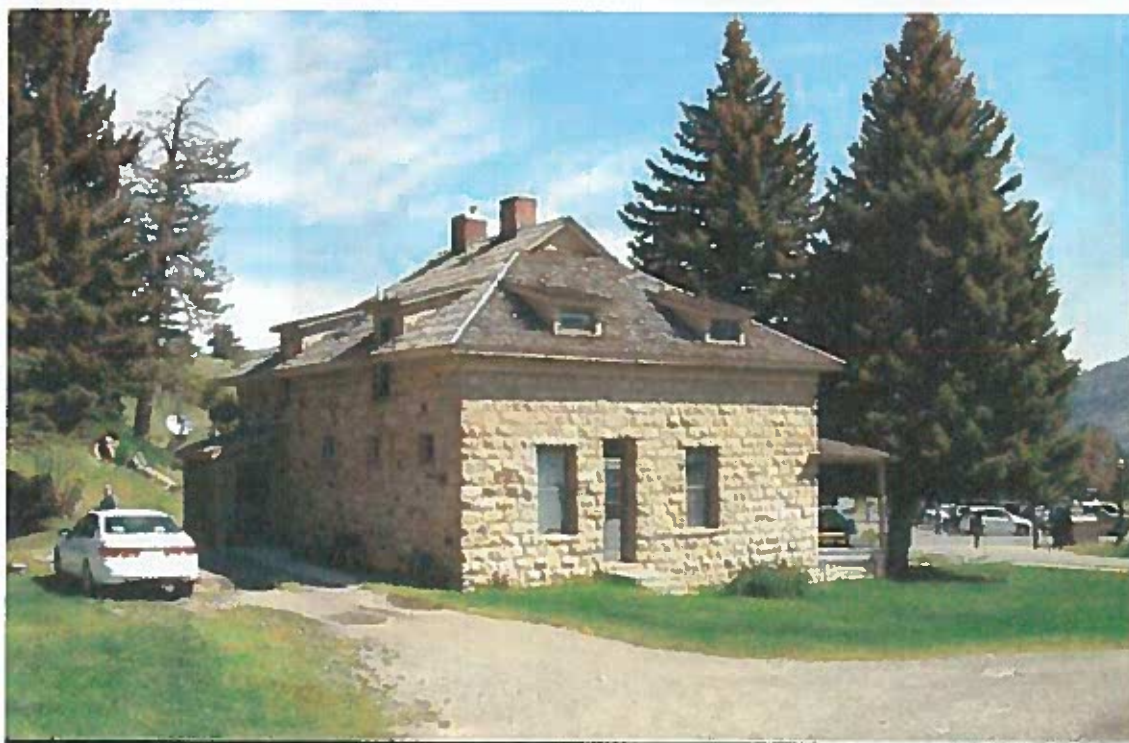
East (front) wall. A full width porch protects the primary entrance. Photo Credit: Ken Sievert



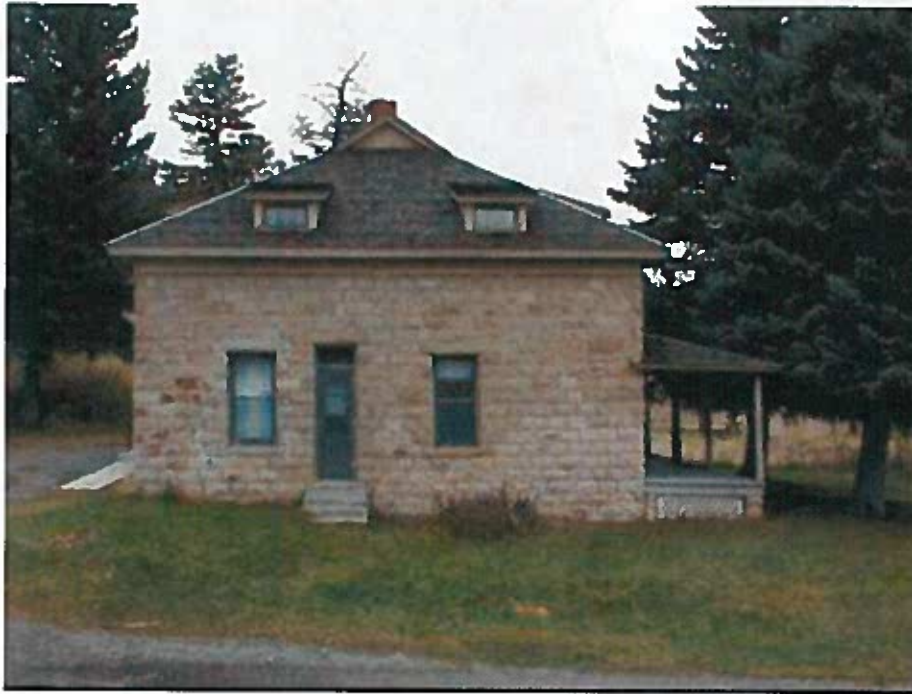
North Wall. Note that the east facing dormer windows interrupt the roof fascia whereas the north facing roof dormers are surrounded by roofing. Photo Credit: Ken Sievert.



West Wall; the vestibule at the back door (shed roof) is not original. The three small square windows once served jail cells within the facility. Photo Credit: Ken Sievert.



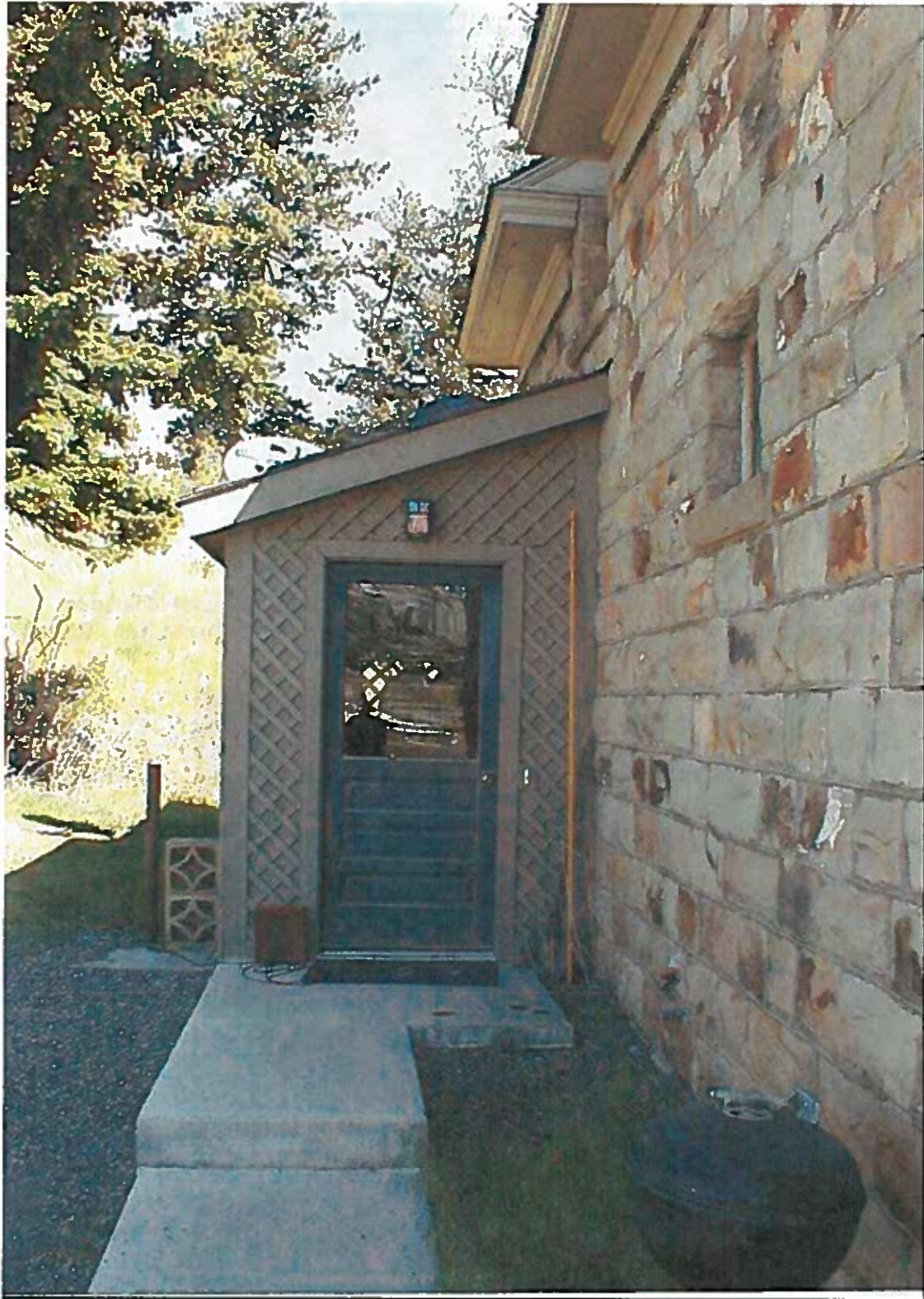
South Wall; the parking lot in the background is located between the U. S. Commissioner's House and the Parade Ground of the original Fort Yellowstone. Photo Credit: Herb Dawson, NPS.



South Elevation – perpendicular view. Note that the side entrance was strategically located to serve the jail independently from the primary entrance into the facility. Photo Credit: Ken Sievert



Underside of porch roof along the East (primary entrance) side of the U. S. Commissioner's house. The members supporting the roof were always intended to be exposed as evidenced by their careful positioning, finished surfaces, and chamfered corners. Photo Credit: Ken Sievert.



West entrance into kitchen. Although contemporary construction, the detailing, door pattern, and colors are sensitive to the historic property. . Photo Credit: Ken Sievert



NE dormer above back door entrance vestibule. The relationship of the shaped ogee fascia, frieze board, and stonework can be seen in this photograph. Note that the newer fascia on the vestibule addition is a plain flat board. Photo Credit: Ken Sievert



Steps at front porch. Photo Credit: Herb Dawson, NPS.



The steps are symmetrically centered on the main entrance door. Note the foot scraper right of the bottom landing. Photo Credit: Ken Sievert.



Wood detailing associated with the side pents of the dormer windows located in the east and west exposures of the house. Dormers in the north and south walls do not extend through the roof plane as previously noted. Photo Credits: Herb Dawson, NPS.



Soffit, fascia, and roof edge detailing at the porch; with the upper roof visible in the background above. Photo Credit: Ken Sievert .



Intersection of the underside of the porch with the stone wall. Photo Credit: Ken Sievert .



Roof framing and underside of sheathing at entrance porch.
 Photo Credit: Herb Dawson, NPS.



Beveled chamfers on the exposed framing members. Recently replaced sheathing boards are unpainted. Photo Credit: Herb Dawson, NPS



Front Porch column and beam supports.
Photo Credit: Ken Sievert.



Condition at base of SE porch column.
Photo Credit: Herb Dawson, NPS.



Calvary style half-round gutter at front porch. Similar gutters are used at the 2nd floor dormers. Photo Credit: Ken Sievert.



Interiors: built-in cabinetry between the kitchen and dining rooms. Note the bead pattern boards used for the back of the cabinets. Photo Credit: Herb Dawson, NPS.



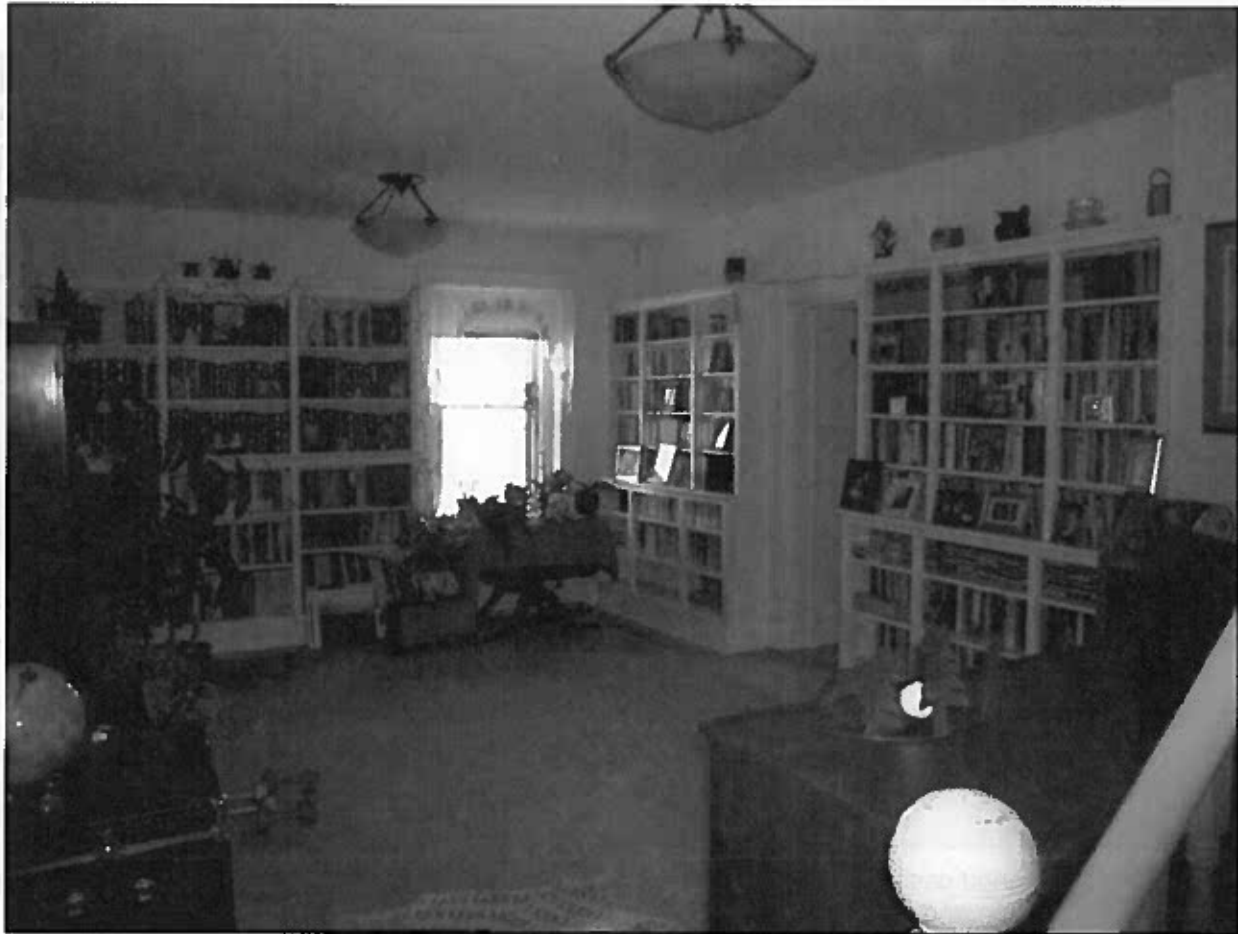
Label block and period casing around interior door between kitchen and dining. Photo Credit: Herb Dawson, NPS



Figured hinges for door; the door is stored and the opening between kitchen and dining is open. Photo Credit: Herb Dawson, NPS.



Drawer pull detail at built-in cabinets shown on previous page. Photo Credit: Herb Dawson, NPS.



Interior of Living Room / Study. The door right-of-center accesses the original jail area – now used as a music room. Exterior walls on this floor of the U. S. Commissioner's house have been furred out and resurfaced with gypsum drywall. It is difficult to tell, but the period woodwork has either been re-installed or was replaced in-kind at the time of the wall modifications.

The ball finial atop the bottom balustrade post of the stairhouse serving upstairs areas is visible in the lower right of the photo.

Note the hardwood flooring within the area. It is not known if this material is original to the space; however, the material is period appropriate and is sensitive to the design of the house. Photo Credit: Herb Dawson, NPS.



Detailing of stair between the Living Room and the sleeping areas located on the upper floor level. The woodwork in the railing, balustrade, and baluster posts may originally have been stained or natural. Photo Credit: Herb Dawson, NPS.



Living Room light fixture. The fixture is appropriate to the current use of the room as well as period appropriate. Photo Credit: Herb Dawson, NPS.



Bathroom / Utility room on the first floor. Materials and finishes within this space are contemporary. Photo Credit: Herb Dawson, NPS.



Contemporary hinge; Bathroom door



Replacement window in west wall of first floor bathroom. This window has been installed in an opening once used as a cell window.



1st floor Bathroom, base moulding. Photo Credit: Herb Dawson, NPS.



SW corner of kitchen showing treatment of cabinetry, woodwork, and flooring. Photo Credit: Herb Dawson, NPS.



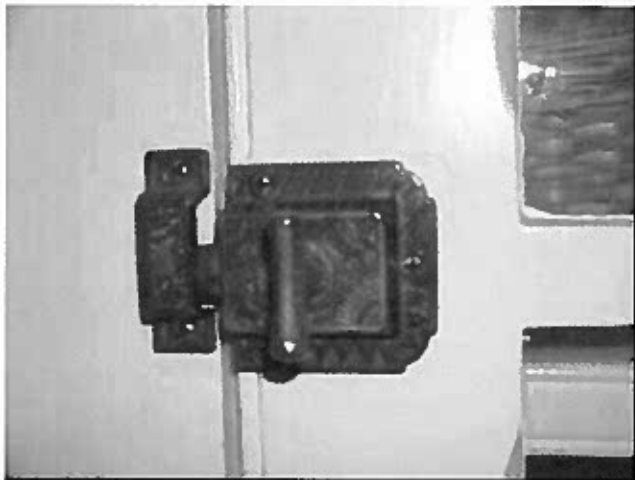
South wall of kitchen. Photo Credit: Herb Dawson, NPS.



NW corner of kitchen. Photo Credit: Herb Dawson, NPS.



NE corner of kitchen. The built-in feature also serves the Dining Room on the opposite side of the wall. Photo Credit: Herb Dawson, NPS.



Hardware on built-in cabinet feature between Kitchen and Dining Room. Photo Credit: Herb Dawson, NPS.



Bead pattern board wainscot remains on all original wall locations within the Kitchen area. Photo Credit: Herb Dawson, NPS.



New cabinet at end of sub-co rridor from Kitchen to Bathroom / Utility. Photo Credit: Herb Dawson, NPS.



Main (and only) stair between first and second floor. Note the change in finishing of the woodwork between the floors. Photo Credit: Herb Dawson, NPS.



The upper landing has been re-configured at some time during the structure's history as evidenced by the duplication in Newel Posts at the top of the stair. Photo Credit: Herb Dawson, NPS.



View looking east within the upper stair hall.
Photo Credit: Herb Dawson, NPS.



View looking west within the upper stair hall.
Photo Credit: Herb Dawson, NPS.



Entrance into Room 206 from the upper stairhall. The standing and running trim, transom, and door are typical throughout the floor and are all historic. Photo Credit: Herb Dawson, NPS.



Detail of wood base, door casing, and plinth blocks typical of 2nd floor. Photo Credit: Herb Dawson, NPS.



Detail of door stop. Photo Credit: Herb Dawson, NPS.



Bedroom 202 in the SW quadrant of the 2nd floor.
Note the change in ceiling slope to accommodate the original dormer window. Wall finishes have been re-surfaced within the guidelines of DOI standards. Photo Credit: Herb Dawson, NPS.



Closet door within Bedroom 202. A 2nd closet of equal size is symmetrically located in the opposite corner of the room. Photo Credit: Herb Dawson, NPS.



South facing dormer window within Bedroom 202. Note that this is one of the dormer windows that does not extend through the plane of the roof but is surrounded by the roof (see exterior elevations). Photo Credit: Herb Dawson, NPS.



Built-in dresser below the south facing dormer window; this unit is inserted between the two closets along the south wall. Photo Credit: Herb Dawson, NPS.



Original transom above entry door into Bedroom 202. All features associated with this assembly exhibit a high degree of integrity. Photo Credit: Herb Dawson, NPS.



Detail of period molding and transition block surrounding the doors and windows in room 202. This woodwork is typical throughout the 2nd floor. Photo Credit: Herb Dawson, NPS.



Historic door hardware on the entrance door into Bedroom 202. Photo Credit: Herb Dawson, NPS.



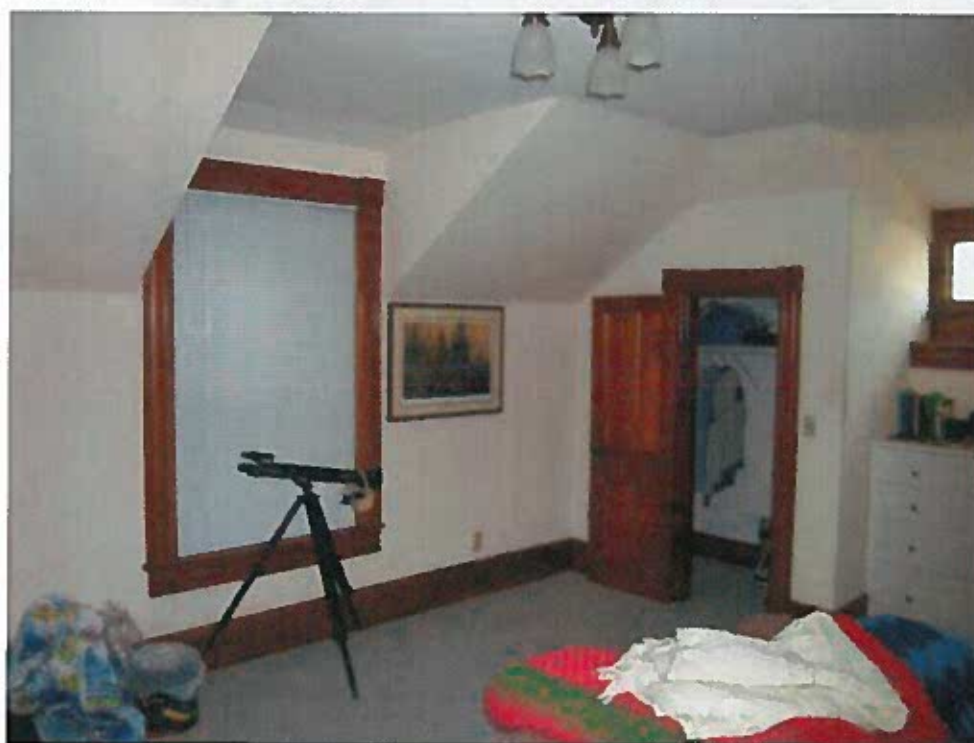
Introduced skylight above bathtub in Bathroom 203. Photo Credit: Herb Dawson, NPS.



View within Bathroom 203 on the 2nd floor of the U. S. Commissioner's house. All plumbing fixtures are contemporary. Photo Credit: Herb Dawson, NPS.



Bedroom 204 on the 2nd floor of the U. S. Commissioner's house; looking North. Photo Credit: Herb Dawson, NPS.



View to NW within Bedroom 204. Note the slope of the ceilings at the windows. Photo Credit: Herb Dawson, NPS.



Bedroom 204 on the 2nd floor of the U. S. Commissioner's house; looking South to corridor door and transom. Note fire detection alarm on ceiling. Photo Credit: Herb Dawson, NPS.



Bedroom 205 on the 2nd floor of the U. S. Commissioner's house; looking South to corridor door.
Photo Credit: Herb Dawson, NPS.



North dormer window in Bedroom 205.
Photo Credit: Herb Dawson, NPS.



Bedroom 206 on the 2nd floor of the U. S. Commissioner's house; view to SE. Photo Credit: Herb Dawson, NPS.



South dormer window in Bedroom 206. Photo Credit: Herb Dawson, NPS.



View of the north wall of the basement utility room. The pumped air system is for radon elimination from the sub-structure of the residence. Photo credit: Ken Sievert.



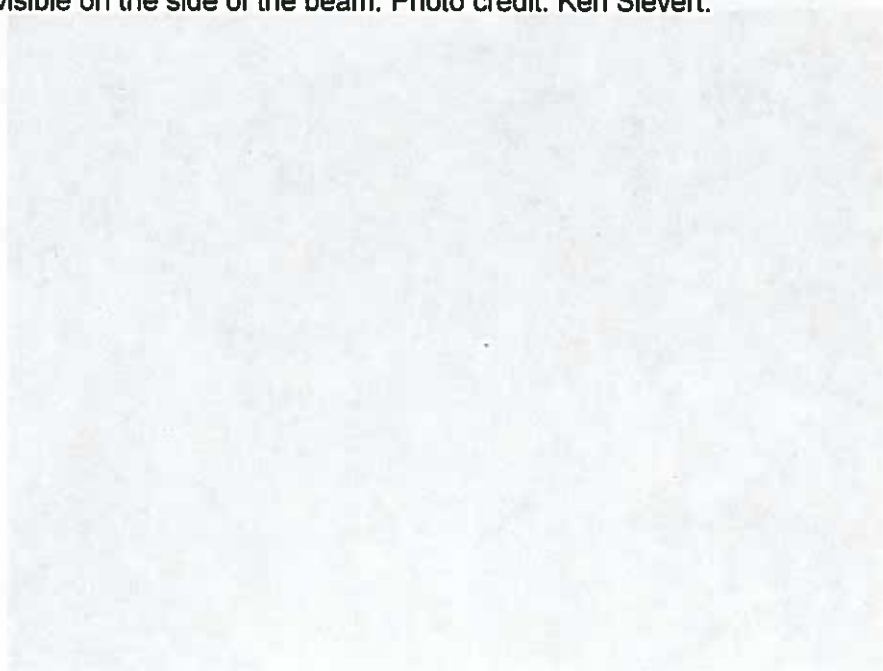
Looking up into the stairhouse of the utility stair serving the basement area.



Transition of the basement ceiling to the utility stair, looking NW. Photo Credit: Ken Sievert



Steel support girder across the center of the north end of the house (see plan for location). The fabricator's foundry mark is visible on the side of the beam. Photo credit: Ken Sievert.





Center access from north basement room into crawl space below the south end of the house. This area would have been below the jail cells in the original plan of the facility.
Photo credit: Ken Sievert



Closer view through the access identified above.
Photo Credit: Ken Sievert.



East access into the crawl space from the basement stair. The stone foundation can be seen as well as the earth berm against the footing. Note the contemporary weatherization materials applied to the floor structure. Photo credit: Ken Sievert



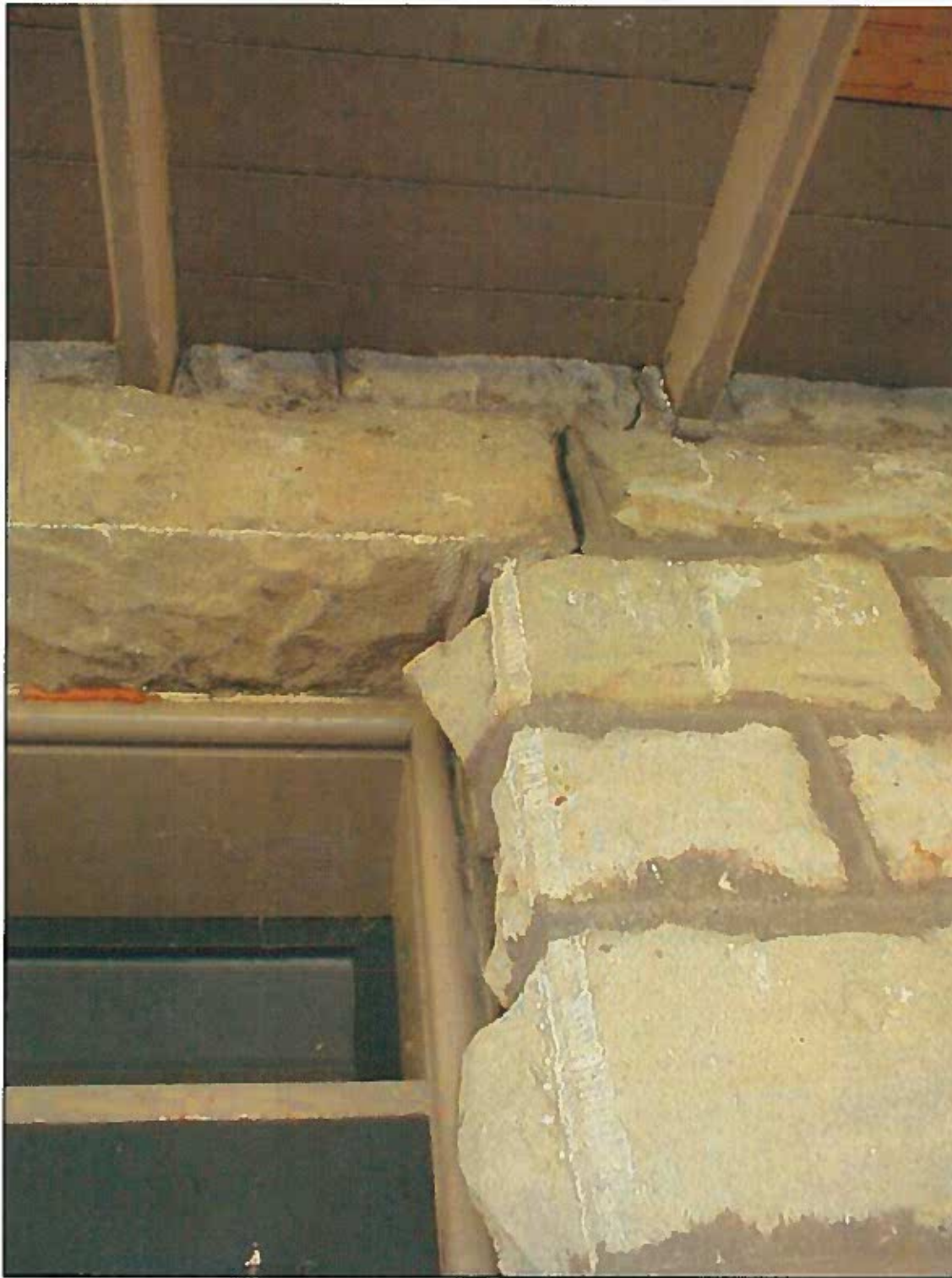
Water service adjacent to the east foundation wall. Photo Credit: Ken Sievert



Attic – view to SE showing south chimney.



Attic – view to south showing south chimney. Note the replacement sheathing in the plane of the roof and the general good condition of the wood members throughout. Photo Credits: Ken Sievert



Recent repair of stone lintel above main entrance door in east wall. Photo Credit: Ken Sievert



Crack at base of north wall. Photo Credit: Herb Dawson, NPS.



Degradation – base of north wall; east end. Photo Credit: Ken Sievert



Stonework next to areaway along north wall. Note moss & lichen on concrete Areaway and window sill. Photo Credit: Ken Sievert



Failed mortar joints below north kitchen window; note crack in window sill. Photo Credit: Ken Sievert.



General views of the west stone bearing wall adjacent to the small square cell windows. Note the failed mortar and cracks above the right window. Stonework close to this window and around the perimeter of the left window is of a slightly different hue than the remainder of the wall suggesting that it came from a different location in the quarry or that it has been replaced.

Photo Credits: Ken Sievert & Herb Dawson, NPS.



Closer view of cracks described on previous page. Photo Credit: Ken Sievert



Slight crack below sill of west window; following the coursing of the stonework. Selected areas of the masonry joints have been repointed as can be seen near the bottom of the photo. Photo Credit: Herb Dawson, NPS.



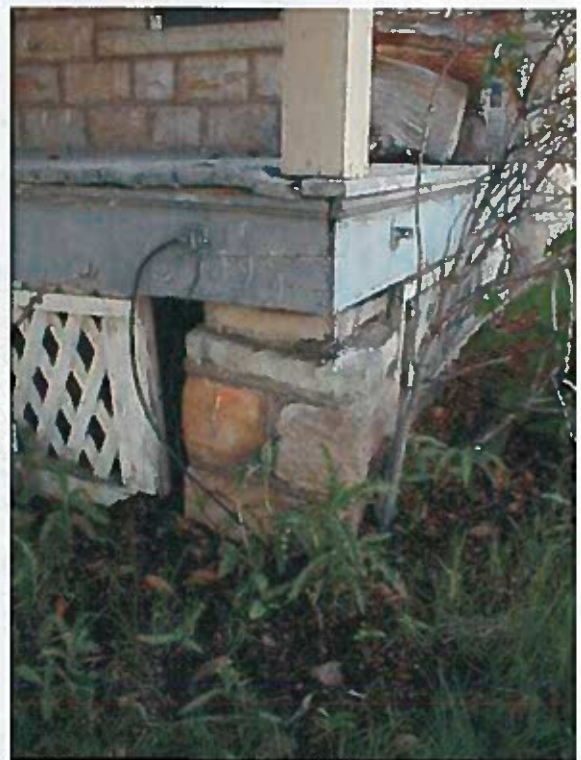
West end of south stone wall; this area of the structure exhibits the greatest amount of failed stone masonry in the building with significant cracks, spalls, and minor movement. Evidence of past repairs can be seen in some of the mortar joints in the detailed photos below, but deterioration has continued since the repairs. Photo Credits: Ken Sievert & Herb Dawson, NPS.



Recent repair of stone lintel above main entrance door in east wall. Photo Credit: Ken Sievert



Stone porch piers along the north side of the entrance porch deck. Both piers are leaning and require stabilization. The latticework wood barrier adds architectural delicacy to the use of the structure as a place of residence, but is in need of repair. Photo Credits: Ken Sievert





Stone porch pier at the SW corner of the entrance porch deck. The pier is rotated, fractured, and requires stabilization. Photo Credits: Herb Dawson, NPS.



Other angles of stone porch pier at SW corner entrance porch deck. Photo credit: Herb Dawson, NPS.

PART 2: TREATMENT AND USE

REQUIREMENTS

Building Code Review

A building code analysis was done for the U. S. Commissioner's House to determine if there were major areas of concern to be addressed as part of the preservation plan. This analysis is general in nature but it includes the primary elements that impact current and future use of the facility. Additional detailed building code requirements would be considered during subsequent phases of project development or preparation of construction documents; detailed requirements are defined to include those technical issues that would not adversely impact the concepts or recommendations for this structure.

Building Codes reviewed during the preparation of this report included:

- ***2006 International Existing Building Code (IEBC).*** The provisions of this Code constitute the minimum standards for change of occupancy, alteration, or repair of existing buildings and structures including Historic structures. The purpose of this code is to encourage the continued use or reuse of existing buildings and structures.
- ***2006 International Building Code (IBC):*** This Code provides minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures. This code is intended for use with new structures and as a source of criteria for the IEBC by reference.
- ***NFPA 101 - Life Safety Code***

Criteria

As applicable to the U. S. Commissioner's House, the IEBC has been determined to be the primary reference for evaluation of the property. If in the process of evaluating the structure an unsafe condition is uncovered, then the appropriate authorities will be duly advised.

The requirements of IBC are generally more specific than those of the IEBC due to the fact that they are applicable to new construction rather than the reuse of existing buildings; however, the two codes are very similar in regard to topics dealing with life – safety issues. Both codes were consulted and are reported on in the following pages in the interest of allowing park administration to evaluate the benefits of attaining a higher standard of safety if cultural values are not compromised and if the cost / benefit ratio is low.

The application of the IBC and its companion code, the IEBC, is a recent development in the Western United States. The IEBC, in contrast to its forerunner the Uniform Code for Building Conservation, is more lenient in regard to recognized historic structures that are to remain as-is or are to be repaired; however, alterations or changes in occupancy quickly shift the emphasis toward new construction criteria depending on the level of impact from the proposed changes. The IBC and the IEBC also require automatic fire sprinkler systems to a much greater extent than the previously used codes. Depending on the nature of the historic property these systems can affect cultural values; at the very least they add considerable expense to the maintenance of the property. Those impacts are identified on the following pages.

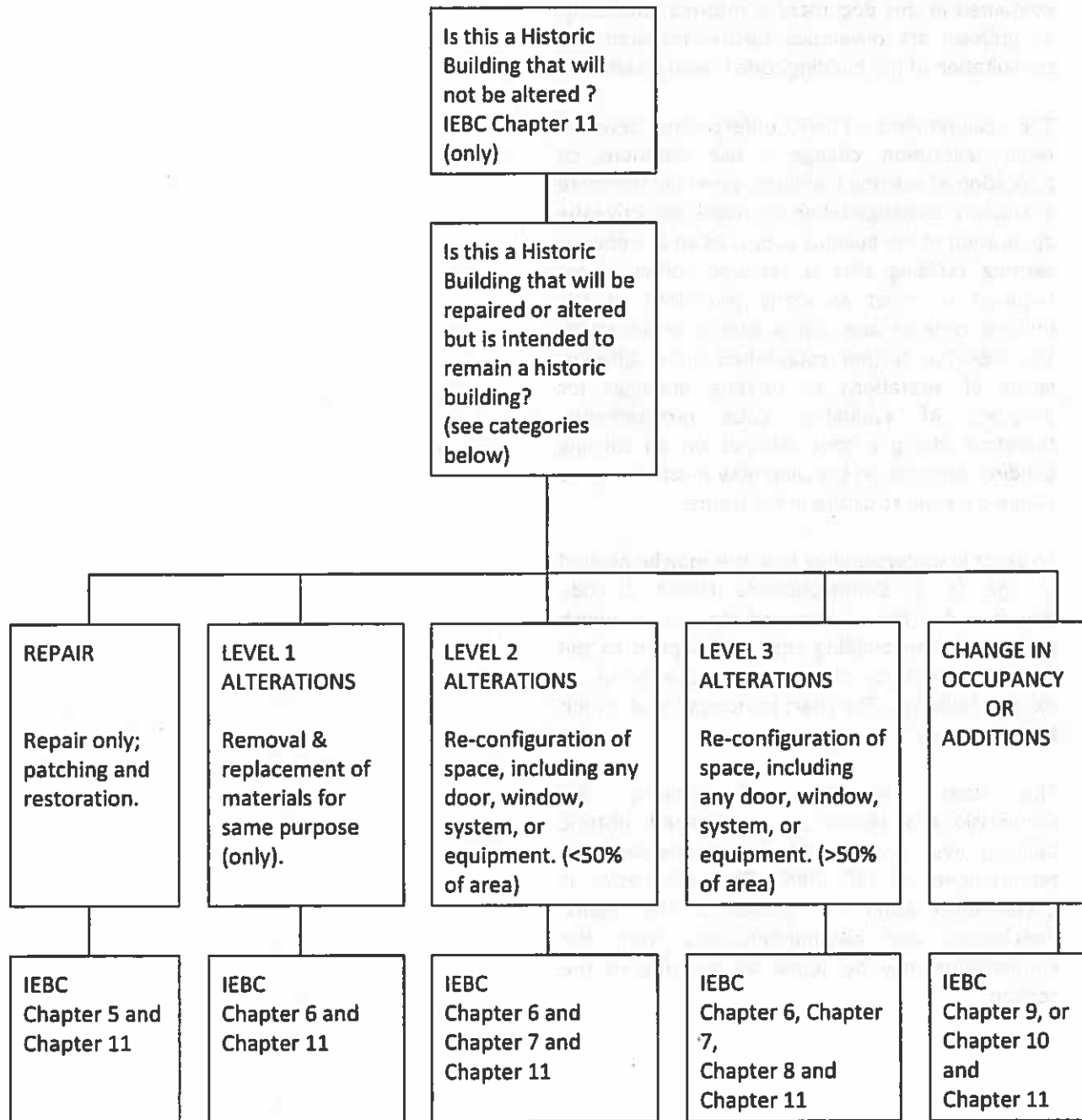
Reviewers are cautioned that the code information contained in this document is informational only; as projects are developed further research and consultation of the building code is warranted.

The requirements of IEBC differentiate between repair, alteration, change of use, additions, or relocation of existing buildings; generally the more a structure is changed then the more restrictive the application of the building codes. As an example an existing building that is repaired (only) is not required to meet as many provisions of the building code as one that is altered or added to. The IEBC has further established three different levels of alterations to existing buildings for purposes of evaluating code requirements; therefore, doing a code analysis on an existing building depends on knowing how much change is planned for the structure in the future.

To assist in understanding how this may be applied to the U. S. Commissioner's House a code flowchart has been developed that shows which portions of the building code are applied to the various repairs or changes that can occur to existing buildings. The chart is incorporated on the following page.

The code alternative of treating the Commissioner's House as a 'repaired historic building' was investigated and compared to requirements of IBC 2006. That alternative is documented within this section of the report. Conclusions and recommendations from the comparisons may be found at the end of the section.

INTERNATIONAL EXISTING BUILDING CODE (IEBC) FLOWCHART



The U. S. Commissioner's House historic property has been evaluated as a repaired building with consideration to Level 1 alterations to permit structural strengthening for comparison on the following pages. This evaluation assumes that the facility will continue to be used as it is currently used as a private place of residence for personnel in the park administration. It also assumes that the structure will not be reconfigured as a part of any repair or stabilization effort.

BACKGROUND DATA FOR CODE ANALYSIS

BUILDING INFORMATION:

Primary Occupancy Group - Type 'R-3'

Section 310

This information is from the 2006 IBC

Provisions from the International Residential Code may also apply

Occupancy Category: IBC classification II

Table 1604.5

Type Of Construction (Existing) - Type V-B

Section 602.5

Area

Separation: None

Allowable height and area:

Height
Area

3 stories
unlimited

Table 503

Occupant Load (Summary)

	NSF**	Occupants	Total Exit Width (in.) req'd @ 0.2/occ.	
First Floor	973.63	4.87	11.45	2.29
Second Floor	1052.28	5.26	Note: min width is 44"	
Floor				
Lower Level	395.98	1.32		
	2421.89	11.45	Section 1017.2	

** does not include area taken up by walls.

**Tabulation of
Spaces**

Table 1004.1.1

						NO. OF EXIST		
RM	NAME	NSF	OCC. GROUP	SF/OCC	OCC LOAD	EXITS	EXITS REQD	REMARKS
101	Dining	208.05	R-3	200	1.04	2	1	2 if thru adj space
102	Living / Study	254.30	R-3	200	1.27	2	1	
103	Music Room	180.06	R-3	200	0.90	2	1	2 if thru adj space
104	Bath / Utility	47.20	accessory	200	0.24	1	1	
105	Kitchen	237.49	R-3	200	1.19	1	1	
106	Vestibule	46.53	accessory	200	0.23	1	1	
	Corridor /							
201	Stair	126.83	R-3	200	0.63	1	1	
202	Bedroom	236.20	R-3	200	1.18	1	1	includes closets
203	Bathroom	56.16	accessory	200	0.28	1	1	
204	Bedroom	182.53	R-3	200	0.91	1	1	includes closets
205	Bedroom	207.89	R-3	200	1.04	1	1	includes closets
206	Bedroom	242.67	R-3	200	1.21	1	1	includes closets
B-1	Utility	395.98	accessory	300	1.32	1	1	
TOTALS		2421.89			11.45			

**INTERNATIONAL EXISTING BUILDING CODE (IEBC)
CODE ANALYSIS**

Project: U. S. Commissioner's House

The U. S. Commissioner's House was evaluated as a repaired historic building (only); it has not been evaluated as a building that is re-configured, altered, or added to.

SECTION	DESCRIPTION	TO BE REPAIRED	REMARKS
<u>Historic Building That will be Repaired (only)</u>			
1101.2	Building investigated, evaluated, and written report prepared	X	Investigation & Report Required
1102.0	Repairs may use original or in-kind materials	X	May use in-kind materials
	If building is determined dangerous, no work is required except to correct identified unsafe conditions	X	Unsafe conditions corrected
	Historic Buildings undergoing repairs to comply with Chapter 4 of IEBC	X	See Below
	Replacement glazing in hazardous locations must comply with safety glazing requirements in IBC	X	Safety glazing rgmt's apply if glass replaced at hazardous locations.
	Replacement glazing in ordinary locations may use original (or in-kind) materials	X	
<u>Chapter 4 - Classification of Work</u>			
402.2	Repairs shall comply with chapter 5		
<u>Chapter 5 - Repairs</u>			
501.2	Use materials permitted by Code or use like materials	X	May use in-kind materials
501.3	Work shall make building no less conforming to code than it was before the repairs	X	No-less safe
502.1	Cannot use hazardous materials for repair	X	Hazardous materials prohibited
502.2	Replacement glazing to comply with safety glazing requirements.	X	Safety glazing rgmt's apply
503.1	Existing level of fire protection to be maintained.	X	Maintain existing fire resistance
504.1	Existing means of egress maintained.	X	Existing exiting maintained

**INTERNATIONAL EXISTING BUILDING CODE (IEBC)
CODE ANALYSIS**

Project: U. S. Commissioner's House

SECTION	DESCRIPTION	TO BE REPAIRED	REMARKS
505.1	Existing level of accessibility maintained.	X	<i>See section on building codes</i> Seismic evaluation required Wind evaluation required
506.1.1	Seismic Evaluation Required (see IEBC for detailed requirements)	X	
506.1.2	Wind design and analysis is required of existing building undergoing repairs.	X	
506.2.1	Dangerous conditions to be eliminated Electrical repairs may be done with like material except:	X	
507.0	Receptacles to comply with 406.3(D) of NEC Grounding of grounding type receptacles permitted to be grounded to any point.	X	
508.0	Repairs to be no less conforming than it was before the repair	X	
509.0	Plumbing: Materials used for repair must conform to the International Plumbing Code		
509.2	Water closets: see IEBC for water consumption limitations maximum capacity shall be 1.6 gallons per flushing cycle.(3.5 gallons for blowout design).	X	

STRUCTURAL CONSIDERATIONS

CRITERIA FOR SELECTED STRUCTURAL SYSTEMS

LOCATION

Mammoth; Yellowstone National Park - 44 degrees 59' North latitude; 110 degrees 42.9' West longitude; 6380' elevation.

STRUCTURAL BUILDING CODES

Building codes and requirements applicable to the engineering evaluation of this structure are as follows:

- 2006 International Building Code (An occupancy classification has been established in the Building Code section of this report)

- 2006 International Existing Building Code
- Recommended Lateral Force Requirements - Structural Engineers Association of California (reference only)
- MSU CE & EM publication: Snow Loads For Structural Design In Montana (Videon-reference only)
- Iowa State University Publication: Structural Snow Loads (Keller - University Of Colorado)
- ASCE 7-latest edition

LOADS

Loading and factors pertinent to the development of this structure include:

VERTICAL LOADS

Snow - (Note: Univ of Colorado & MSU publications are very similar)

From U. Colorado CE publication:

$P_g = .012 \times \text{elevation of } 6380'$

= 76.6 PSF unfactored ground snow load

Exposure 'C';

50 year mean reoccurrence

$C_e = 0.9$ for 20' ht. structure

Importance factor of 1.0

$P_f = (C_e)(I_w)(P_g)$;

Resultant snow load = 68.9 PSF (occupied)

(w/o DOL factor)

(Drifted snow must be accounted for as applicable)

As a footnote IBC designates YNP as an area requiring a site - specific case study; the U. Colorado study is site specific and the MSU study applies to adjacent areas of Montana near the Park and was not used.

USE 68.9 PSF (general)

Floor Live Loads (Occupancy Category II)

Residential Occupancy - 40 PSF

Mechanical & Electrical Equipment loads -
Actual Weight

LATERAL LOADS

Wind - 90 MPH basic wind speed; exposure 'B'
(general); importance factor of 1.00 (IBC section
Basic wind pressure $P = 14.40$ PSF (calculated)

Uplift on roof $P = (-) 10.00$ PSF

Seismic (earthquake); Static Lateral Force
Procedure - section 12.6 - ASCE 7 - 2005

Occupancy Group - II (non-essential)

Importance factor I_o (table 11.5.1)

Site Class D assumed; (used in lieu of Soils
investigation)

From Building Seismic Safety Council maps
(NEHRP):

Maximum Considered Earthquake (MCE) -
Short Period Response Coefficient = 1.25g

Maximum Considered Earthquake (MCE) - Long
Period Response Coefficient = 0.50g

Soil / Structure interaction factors:

$F_a = 1.0$

$F_v = 1.5$

Design Earthquake Factors (% of gravity; adjusted
for site and structural type)

$SDS = .8333$ (short period earthquake)

$SD1 = 0.50$ (long period earthquake)

Evaluate structure based on worst load
from (2) factors calculated above.

Based on the building code and calculation
(attached), the U. S. Commissioner's House falls
into a Seismic Design category 'D' classification.

Interior walls and partitions - 5 PSF lateral load
(minimum) - IBC 1607.13

Concrete / masonry wall base anchorage - 280
PLF - IBC 1604.8.2

SOILS

It has not been determined that a soils
investigation has been done at this site.

OTHER CONSIDERATIONS

Hazardous materials: - obvious hazards were not
identified at the site during the preparation of this
report; however, survey and abatement of
hazardous materials is not included within the
scope of services for this report.

Movement of the structure: it is recommended
that thermal, shrinkage, and time - dependent
factors continue to be monitored at the facility.

FACTORS PERTAINING TO STRUCTURAL EVALUATIONS:

Live load reduction factors were not applicable to
this review because the spans and supported areas
in the facility are smaller than the minimums
established by the building code.

Duration Of Load factors:

1. A duration of load factor of 1.15 has been
assigned for Snow Loads.

2. A duration of load factor of 1.33 has been
assigned for Seismic and Wind Loads.

Deflection is a measure of rigidity and is significant
to safety for structures that are continuous frame
systems; it is not generally a safety consideration
for structures like this residence but is rather a
measure of performance. Performance criteria for
new construction can be found in Chapter 16 of
the 2006 IBC for comparison. Significant

deflections were not noted at the U.S. Commissioner's House based on visual observation.

FINDINGS:

For this report, selected calculations were done to preliminarily assess the ability of the structure to withstand forces as defined by applicable building codes and as outlined above; however, additional engineering calculations will be required to verify strengths and resistance of repair methods at the time that remedial construction (if any) occurs. Determining the magnitude of forces and the capacity of the existing structural members is useful for giving insight into potential areas of deficiency that may ultimately have to be addressed. Results from those preliminary assessments is as follows:

- Roof rafters were investigated on a preliminary basis by using simple beam analogies; they were found to be undersized for the snow loads projected by the procedure described earlier in this section. However, it is not recommended that they be added to, or modified, to satisfy the calculated stresses for the following reasons:
 - 1) The rafters have a long term record of successful performance
 - 2) Existing capacity will withstand approx. 3' of snow; due to the slope of the roof greater depths would occur infrequently
 - 3) The house is in an occupied townsite, visible to maintenance personnel, and snow removal could be initiated if required
 - 4) There are random braces installed within the attic area and there are very few long span rafters within the roof due to the hip roof profile.
- Second floor joists were investigated on the same basis as used for the roof rafters. They were found to be adequate for the code required loading for this occupancy. First floor joists (slightly larger but similar spans as for the second floor) are judged to be O.K. by inspection.
- Earthquake loading as required by building

codes is based on statistic probability that is determined from the history of seismic activity in a region, the presence of known faults in the area, and the geology of the underlying soils. The coefficients used in the formulas are then developed by the National Earthquake Center and published in the building codes as maps. Seismic forces are high in Yellowstone National Park due to the volatile nature of the site and the high acceleration factors that the building codes list for that location.

- The lateral resistance of the U. S. Commissioner's House can be characterized as being a massive shear wall/bearing wall system comprised of unreinforced stone masonry and supported by an unreinforced stone masonry foundation.
- In terms of past seismic performance, the structure has experienced significant forces from historic seismic events (i. e. Hebgen quake of August 1959) and it does exhibit numerous crack patterns and separation between adjacent stones that may possibly be related to past seismic events. It cannot be stated with certainty that the cracks observed were the result of earthquakes; they could also be attributed to soil movements or material failures. They do not exhibit the diagonal patterns usually associated with shear failure (from earthquakes) and the cracks tend to follow mortar joints as opposed to fracturing the individual stones, suggesting separation rather than settlement.
- Because of uncertainty of the cause of the cracks in the stone bearing walls, it was decided to perform a basic lateral analysis of the structure to determine possible areas of vulnerability of the structure to seismic events (that analysis is appended to this report). The results of that analysis indicate that for a Maximum Considered Earthquake (MCE), as defined by current data and current building codes, the North and

South bearing walls on the first floor would be subjected to high stresses and would likely fail. It may be possible to stiffen those walls within the furred space along the walls that was installed in 1999.

- It is recommended 1) that a rigorous lateral analysis be completed as a follow-up to the basic analysis attached, and 2) that stiffening of the first floor north and south walls be included within the preservation plan for this historic property.
- Soils related movements - None were noted during visits to the site during the preparation of this report.

Except as noted, the structure is believed to be fundamentally sound.

EVALUATION OF U. S. COMMISSIONER'S HOUSE FOR COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT.

Accessibility Provisions required by the 2006 IEBC for a registered historic property that will be repaired, or altered with no proposed changes to the plan configuration (Level 1 alteration), are paraphrased below:

Section 1104 of the 2006 IEBC requires that the accessibility provisions of section 605 of the IEBC must also be complied with; or alternative requirements of 1104.1.1 to 1104.1.5 may be applied.

Section 605 of the 2006 IEBC also references Chapter 11 of the 2006 IBC; section 1103.2.4 of the IBC code recites the following general exception (applicable to the U. S. Commissioner's House):

"1103.2.4 Detached Dwellings. Detached one – and two – family dwellings and accessory structures, and their associated sites and facilities, are not required to be accessible."

Alternative requirements (applicable to publicly accessible spaces; not applicable to detached dwellings):

1104.1.1 Site arrival route to one main entrance must be accessible

1104.1.2 Accessible route from accessible entrance to public spaces on the level of the entrance

1104.1.3 One main entrance must be accessible

1104.1.4 One accessible toilet room must be provided

Discussion: Although it is not privately owned, the Commissioner's House is clearly a single family detached residence that is not dedicated to public use on any level of the structure. In addition, in the event that NPS employed personnel with mobility impairments, there are other accessible housing units available for their occupancy. However, in the interest of thoroughly reviewing ADA requirements, the Commissioner's House was generally reviewed to assess the degree of difficulty that would be encountered if the facility were altered to comply with all public accessibility criteria. The conclusions from that cursory review are as follows:

Site arrival and route – With minor modification to navigable surfaces, this ADA requirement is generally in compliance due to the proximity of the driveway to the rear vestibule and the presence of a concrete sidewalk along the west side of the house.

ADA entrance – Although the primary main entrance could not be made accessible without threatening significant historic and cultural values, the west vestibule is generally in compliance with ADA requirements. The side setback provisions at doors would have to be addressed.

First floor spaces – All spaces on the first floor of the facility could be made to comply with ADA requirements with minor modification to selected door widths and door side setbacks.

Second floor spaces – Providing for ADA accessibility to second floor spaces would have an adverse effect on historic and cultural values of the

house, and could threaten or destroy the historic significance of the property.

Conclusion: The first floor of the property could be made to be accessible relatively easily; the second floor would require significant investment and result in the loss of historic and cultural values.

SUMMARY

The analysis on the previous page is based on the assumption that the use of the U. S. Commissioner's House will continue as private housing for administrative personnel of the National Park Service. As a detached dwelling, it is not required to comply with the accessibility provisions of either the IEBC or IBC, by reference.

In the event that there is a change in use for the property, or if the building is used for public visitation, these conclusions should be re-assessed.

BUILDING CODE SUMMARY

From the standpoint of building codes, the recommended treatment for the U. S. Commissioner's House after consideration to the classifications studied is to perform all work on the building to comply with the 'Repair' category of the International Existing Building Code and to continue to use the facility for its current purposes as a residence for Park Administrative personnel if these uses are consistent with regional planning of the National Park Service; this alternative will preserve and protect the greatest amount of historic fabric within the building and is consistent with the 'Preservation' classification of applicable DOI standards.

In general, the residence as it exists is in compliance with requirements of the current building codes. Future considerations might include providing accessibility to the first floor of the residence in the event that the public was allowed to visit the historic property.

RECOMMENDED ALTERNATIVES

TREATMENT OF USE / PRESERVATION PLAN

Basis for the Preservation Plan

The Preservation Plan is derived from review of the historic documentation of the U. S. Commissioner's House and associated Carriage House, the rating/priority matrix of the condition assessment, and the technical evaluations of fire, code compliance, and structural safety.

The extent of work to be accomplished at the property must be consistent with a high standard of preservation ethics and integrity as mandated by the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The recommendations contained within this Preservation Plan are based on the following rationale:

The proposed treatment of the building is preservation of existing fabric and replacement with in-kind materials to the maximum extent feasible, with consideration to protection of persons and property from life - safety issues. The intent is to sensitively integrate repair materials, incorporate life - safety elements, and provide for continued use of the structure without compromising the historic character.

Continued use of the Commissioner's House will have elements of Preservation, Rehabilitation, and Restoration included within work suggested by this report. Reconstruction is not contemplated.

1. Exterior elements will be rehabilitated at locations where they cannot be preserved, and preserved whenever possible.
2. All interior habitable spaces will be preserved. They will be restored at locations impacted by the introduction of concealed seismic stabilization assemblies.
3. Site features will be minimally impacted.

The final appearance of the Commissioner's House and Carriage House is intended to be the same as what we see today; with emphasis on having the stonework rehabilitated. The buildings have portrayed that appearance throughout their history, and continue to exhibit the design qualities of a specialized administrative structure that was

created as part of the Fort Yellowstone military complex.

The following paragraphs summarize the priority of work to be implemented as recommended by this Historic Structures Report. Building elements identified as "critical" or "serious" in the condition assessment portion of this report are reflected in this listing of priorities.

PRIORITY #1 - RESIDENCE

Introduction of additional seismic resistance has been identified as the first priority of the preservation plan. As a prelude to this work it is necessary to implement engineering documentation and testing to define the extent of this work.

PRIORITY #2 - RESIDENCE

Fundamental repair of exterior stone masonry has been assigned as Priority #2. As reported elsewhere within this report, selected areas of the exterior stone exhibit significant degrees of deterioration that must be addressed.

PRIORITY #3 - RESIDENCE

Restoration of the front porch supporting system in-total is identified as the third Priority.

PRIORITY #4 - RESIDENCE

Introduction of additional heating (and cooling) capabilities within the house has been assigned as Priority # 4.

PRIORITY #5 - RESIDENCE

Exterior rehabilitation of windows and doors is listed as Priority # 5.

PRIORITY # 1 - CARRIAGE HOUSE

Re-roofing is the number # 1 Priority for the Carriage House.

PRIORITY # 2

Verifying the adequacy of the foundation has been assigned as Priority # 2 for the Carriage House.

PRIORITY # 3

Rehabilitation of the exterior windows and doors is Priority # 4 for the Carriage House.

PRIORITY # 4

Priority # 4 for the Carriage House is re-painting and sealing of exterior wood siding and trims.

OTHER PRIORITIES:

A listing of other related work to be done to the U. S. Commissioner's House and associated Carriage House and a prioritization of that work is shown on the accompanying tables. Please note that most of the work listed after Priority # 5 is either in the form of routine maintenance or is listed as 'work not required'. The interior of the House is in remarkably good condition and it is obvious that the facility has been well cared for. The Carriage House (particularly the roof) appears derelict and is in need of immediate attention.

It is realized that budgetary restraints as well as the logistics of construction sequencing will have an effect on the implementation of this plan; however, the table does reflect the order of importance of preservation activities as determined by this report.

Work that is a related task to the 'serious' or 'critical' Priority but is less urgent is often "packaged" together with the Priority in anticipation of how construction activities are performed, sequenced, and managed; as a consequence 'minor' priorities may be included with (or adjacent to) more tenuous work elements.

PRESERVATION PLAN FOR RESIDENCE

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
GENERAL								
General			In-depth seismic analysis				1.01	Building code reqmt
General			Laboratory testing of stone				1.02	Testing
General			Determine depth of fnd & footings				1.03	Testing
LATERAL FORCE RESISTING SYSTEM								
Structure	Lateral force resisting system	Stone bearing walls	(See Structural Commentary)	1	Varied	Critical	1.04	
CUT STONE BEARING WALLS								
Stone Brg Walls	South Wall	Coursed stone	Locally Quarried stone	1	Poor	Critical	2.01	Point; tuck point
Stone Brg Walls	West Wall	Coursed stone	Locally Quarried stone	1	Poor	Critical	2.02	Point; tuck point
Stone Brg Walls	North Wall	Coursed stone	Locally Quarried stone	1	Fair	Serious	2.03	Point; tuck point
Stone Brg Walls	East Wall	Coursed stone	Locally Quarried stone	1	Fair	Serious	2.04	Point; tuck point
Stone Brg Walls	East Wall	Perimeter sealants	Various materials	5	Poor	Serious	2.05	Prep and replace
Stone Brg Walls	South Wall	Perimeter sealants	Various materials	5	Poor	Serious	2.06	Prep and replace
Stone Brg Walls	West Wall	Perimeter sealants	Various materials	5	Poor	Serious	2.07	Prep and replace
Stone Brg Walls	North Wall	Perimeter sealants	Various materials	5	Poor	Serious	2.08	Prep and replace
Stone Brg Walls	East Wall	Smooth stone window sills	Locally Quarried stone	1	Fair	minor	2.09	Water repellant
Stone Brg Walls	South Wall	Smooth stone window sills	Locally Quarried stone	1	Fair	minor	2.10	Water repellant
Stone Brg Walls	West Wall	Smooth stone window sills	Locally Quarried stone	1	Fair	minor	2.11	Water repellant
Stone Brg Walls	North Wall	Smooth stone window sills	Locally Quarried stone	1	Fair	minor	2.12	Water repellant
EAST ENTRANCE PORCH								
Entry Porch	Supports / piers	Cut stone piers at corners; & at front	Locally Quarried stone	1	Poor	Critical	3.01	
Entry Porch	Decking	Wood; oriented E-W	1x4 T&G	3	Poor	Serious	3.02	
Entry Porch	Deck enclosure	Lattice screen	Wd w/ 1x4 frame & diagonal wd pattern	5	Poor	Serious	3.03	
Entry Porch	Floor structure	Wd joist framing	Size unknown	2	TBD	TBD	3.04	

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
MECHANICAL								
Mech	Heat	Elec baseboard / unknown	Contemporary	5	Good	Minor	4.01	
EXTERIOR WINDOWS								
Ext wdw casing	All ex. Vest	Wood (original)	Victorian bullnose casing (see drawings)	1	Fair	Serious	5.01	Dutchman, prep. paint
Exterior wdws	Rm 103 - south	Double hung operating windows	Original wd sash, frames, and hardware	1	Fair	Serious	5.02	Re-hab, ext finish
Exterior wdws	Rm 102; study	Double hung operating windows	Original wd sash, frames, and hardware	1	Fair	Serious	5.03	Re-hab, ext finish
Exterior wdws	Rm 103 - West	Side hinged; inward swinging	1-lite original wd sash, frames, & hardware	1	Fair	Serious	5.04	Re-hab, ext finish
Exterior wdws	Rm 101	Double hung operating windows	Original wd sash, frames, and hardware	1	Fair	Serious	5.05	Re-hab, ext finish
Exterior wdws	2nd BR; E & W	Double hung operating windows	Original wd sash, frames, and hardware	1	Fair	Serious	5.06	Re-hab, ext finish
Exterior wdws	2nd BR; N & S	Side hinged; inward swinging	3-lite original wd sash, frames, & hardware	1	Fair	Serious	5.07	Re-hab, ext finish
Exterior wdws	Rm 105; kitchen	Double hung operating windows	Original wd sash, frames, and hardware	1	Fair	Serious	5.08	Re-hab, ext finish
Exterior wdws	Rm 104; util/bath	Side hinged; inward swinging	1-lite original wd sash, frames, & hardware	1	Fair	Serious	5.09	Re-hab, ext finish
SITE								
Site		Site Grading	Potential for neg drainage at west side	5	Poor	Serious	6.01	Minor shaping
Site		Site - Paths and walks	Gravel pad for car storage across back	5	Poor	Serious	6.02	Add gravel
DORMERS								
Wall dormers		Sidewalls	Wd siding w/ wd trims & casings	1	Fair	minor	7.01	Total prep & paint
Roof dormers		Sidewalls	Wd siding w/ wd trims & casings	1	Fair	minor	7.02	Total prep & paint
EXTERIOR DOORS								
Exterior doors	103A; side entry	Original wd pnl stile & rail door	1/2 lite w/ 3 pnls below & 1 pnl above; dentils	1	Fair	Serious	8.01	Re-hab, ext finish
Exterior doors	Screen doors	Wd panel w/ 1/2 lite	Date unknown; period appropriate	2.5	Fair	Serious	8.02	Re-hab, ext finish
Exterior doors	Ext door casing	Wood (original)	Victorian bullnose casing (see drawings)	1	Fair	minor	8.03	Prep & paint
FOUNDATION								
Foundation	South 2/3	Stone; uncoursed	depth unknown	1	TBD	TBD	9.01	Clean; point
Foundation	North 1/3	Stone; uncoursed; furred out	full story height	1	TBD	TBD	9.02	Clean; point
ROOF ASSEMBLY								

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
Roof		Fascia	Ogee edge moulding	1	Fair to poor	minor	11.01	Total prep & paint
Roof		Fascia	1x flat backboard	2	Fair	minor	11.02	Total prep & paint
Roof		Soffit	1x flat wood; mitered corners	2	Fair to poor	minor	11.03	Total prep & paint
Roof		Soffit trim at wall intersection	Articulated classical moulding	1	Good	minor	11.04	Total prep & paint
Roof		Frieze Board	1x wd; flat, painted	2	Fair	minor	11.05	Total prep & paint
Roof		Returns at wall dormers	Wd siding w/ wd trims & casings	1	Fair	minor	11.06	Total prep & paint
Roof		(pents)	3/4" wd boards - S2S	2	Fair	minor	11.07	Monitor, rplc as need
Roof		Sheathing	Blown in cellulose	4	Good	minor	11.08	Fluff, add
Roof		Insulation - See Ceiling						
WEST VESTIBULE								
West Vestibule	Roof	Fascia	1x wd - flat w/o trim	4	Good	minor	13.01	Paint
West Vestibule	Roof	Soffit	Narrow wd trim	4	Good	minor	13.02	Paint
INTERIOR								
Interior	Crawl space-west	Ceiling Insulation	Various	4	Varied	minor	17.01	Supplement as reqd
Interior	Crawl space-west	W. Wall	Exposed stone	1	Fair	TBD	17.02	Clean; point
Interior	Crawl space-west	S. Wall	Exposed stone	1	Fair	TBD	17.03	Clean; point
Interior	Crawl space-west	E. Wall	Exposed stone	1	Fair	TBD	17.04	Clean; point
Interior	Crawl space-west	N. Wall	Exposed stone	1	Fair	TBD	17.05	Clean; point
Interior	Crawl space-east	Ceiling Insulation	Various	4	Varied	minor	17.11	Supplement as reqd
Interior	Crawl space-east	E. Wall	Exposed stone	1	Fair	TBD	17.12	Clean; point
Interior	Crawl space-east	S. Wall	Exposed stone	1	Fair	TBD	17.13	Clean; point
Interior	Crawl space-east	W. Wall	Exposed stone	1	Fair	TBD	17.14	Clean; point
Interior	Crawl space-east	N. Wall	Exposed stone	1	Fair	TBD	17.15	Clean; point
General			Wind analysis (see appendix)				21.01	Building code reqmt
Entry Porch	Roof	Fascia	3/4" wd; cladding for perimeter beam	1	Fair	minor	23.01	Paint
Entry Porch	Roof	Soffit	Exposed sheathing	2	Fair	minor	23.02	Paint
Entry Porch	Roof	Ceiling below	Exposed sheathing & chamfered	2	Fair	minor	23.03	Paint

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
Entry Porch	Supports	Wd columns	solid sawn 6x6 w/ chamfered corners	1	Fair	minor	23.04	Paint
Entry Porch	Steps	1x wood treads 7 risers	eased edges	2	Fair	minor	23.05	
Ext wdw casing	Vestibule	Wd 1x4; flat	Mitered corners	4	Good	Minor	25.01	Paint
Site		Driveway	Unbordered asphalt south of residence	4	Fair	Minor	26.01	
Site		Window wells	Conc wdw well at north wall (2 wdws wide)	1	Fair	Minor	26.02	
Site		Site turf	Introduced lawn around perimeter of house	4	good	Minor	26.03	
Site		Site - Paths and walks	Concrete walk from east to primary entrance	2	Fair	Minor	26.04	
Site		Site - Paths and walks	3 step conc stoop at south door	2	Fair	Minor	26.05	
Site		Site Grading	Gentle slope from terraces to parade ground	4	Good	Minor	26.06	
Exterior doors	Hardware	Original @ 101 & 103; new @ 105 & 106	Mortise @ 101 & 103; cyl @ 105 & 106	2	Fair	minor	28.01	Ball tip hinges
SITE								
Site	Site Landscaping		(2) large conifers at front (east side) of house	4	natural	No Rqmt		
Site	Site Landscaping		(1) large conifer at NW corner of house	4	natural	No Rqmt		
Site	Site Landscaping		Selected foundation plantings along north wall	4	domestic	No Rqmt		
Site	Site Landscaping		Informal flower grouping near south entrance	3	domestic	No Rqmt		
Site	Site Landscaping	Stone foundation (not part of property)	A stone foundation exists north of the house	NIC				
Site	Site - Paths and walks		Concrete walk from kitchen vestibule to S cor.	4	Good	No Rqmt		
Site	Site - Paths and walks		Conc pad for garbage near back door	4	Good	No Rqmt		
Site	Manholes		Unidentified metal container w of back door	TBD				

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
ROOF ASSEMBLY								
Roof		Roof surfacing	Wd shingle; stepped application	4	Good	No Rqmt		
Roof		Ridges	Wd shingle	4	Good	No Rqmt		
Roof		Flashing	Stepped copper at chimneys	2	Good	No Rqmt		
CHIMNEYS								
Roof chimneys		Brick masonry chimneys	Commons, 1/2 running bond, smooth, salmon	1	Good	No Rqmt		
	N chimney	Chimney cap & vent	Galvanized iron	4	Good	No Rqmt		
DORMERS								
Wall dormers	(2)@E;(2)@W	Shed roofs	Mtls & details same as primary roof	2	Good	No Rqmt		
Roof dormers	(2)@N;(2)@S	Shed roofs	Mtls & details same as primary roof	2	Good	No Rqmt		
CUT STONE BEARING WALLS								
Stone Brg Walls	East Wall	Dressed Corners	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	East Wall	Stone lintels over openings	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	South Wall	Dressed Corners	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	South Wall	Stone lintels over openings	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	West Wall	Dressed Corners	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	West Wall	Stone lintels over openings	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	North Wall	Dressed Corners	Locally Quarried stone	1	Good	No Rqmt		
Stone Brg Walls	North Wall	Stone lintels over openings	Locally Quarried stone	1	Good	No Rqmt		
WEST VESTIBULE								
West Vestibule	Roof	Surfacing	Wd shingle	4	Good	No Rqmt		
West Vestibule	Roof	Sheathing	Plywood	4	Good	No Rqmt		
West Vestibule	Exterior walls	Structure	Wd frame	4	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST		PRIORITY	PR NO.	ACTION
				RTG	COND			
West Vestibule	Exterior walls	Surfacing	Ext pwd w/ corner boards	4	Good	No Rqmt		
West Vestibule	Exterior walls	Trim	Applied lattice-work	4	Good	No Rqmt		
West Vestibule	Foundation	Conc curb at grade	Conc slab-on-grade	4	Good	No Rqmt		
EAST ENTRANCE PORCH								
Entry Porch	Roof	Surfacing	Wd shingle	4	Good	No Rqmt		
Entry Porch	Roof	Sheathing	3/4" T&G w/ beveled center accent	2	Fair	No Rqmt		
Entry Porch	Foot scraper	Iron; embedded in concrete	Period wrought iron	1	Fair	No Rqmt		
EXTERIOR WINDOWS								
Exterior wdws	Skylight; 2nd fl	Roof mounted skylight	Contemporary plexiglass	4	Good	No Rqmt		
Exterior wdws	Rm 106; vest	Fixed lite in west wall (behind screen)	Wd; contemporary	4	Good	No Rqmt		
EXTERIOR DOORS								
Exterior doors	101A; main entry	Original wd pnl stile & rail door	1/2 lite w/ 3 pnls below & 1 pnl above; dentils	1	Fair	No Rqmt		
Exterior doors	105A; kitchen	Original wd pnl stile & rail door	3 panel w/ decorative lite above (sm panes)	1	Fair	No Rqmt		
Exterior doors	106A; W. vest	Contemporary wd pnl stile & rail door	3 panel door w/ 1/2 lite above	4	Good	No Rqmt		
HARDWARE								
Hardware	Int-2nd fl Bdrms	Hinges; latchset; transom rod	Original; mortise lock	1	Fair	No Rqmt		
Hardware	Int-1st fl Bath	Hinges; latchset	Contemporary	5	Good	No Rqmt		
Hardware	Int-2nd fl Bath	Hinges; latchset; transom rod	Original; mortise lock	1	Fair	No Rqmt		
Hardware	Int-2nd fl Clos	Hinges; latchset	Original; mortise latch	1	Fair	No Rqmt		
Hardware	Int-rm 101 to 105	Hinges only	Original	1	Fair	No Rqmt		
Hardware	Int - rm 102 to 103	Hinges only	Original	1	Fair	No Rqmt		
Hardware	Int-101 china	Hinges; bin pulls, catch	Original or compatible	1	Fair	No Rqmt		
Hardware	Int -105 china	Hinges; bin pulls, catch	Original or compatible	1	Fair	No Rqmt		
Hardware	Int-DH wdws	Sash locks; rope; pulley	Original or compatible	1	Fair	minor		Re-hab w/ Priority # 5
Hardware	Int-CSMT wdws	Hinges; catch	Original	1	Fair	No Rqmt		
MECHANICAL								
Mech	Fixture vents	Various	Introduced	5	Good	No Rqmt		
Mech	Waste	Unknown	Not evaluated			TBD		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
Mech	Water supply	Copper	Not evaluated			TBD		
Mech	Radon vent	Fan and ductwork	Contemporary	5	Good	No Rqmt		
Mech	Dryer vent	Galvanized iron	Contemporary	5	Good	No Rqmt		
ELECTRICAL Elec	Service	Underground - unknown	Not evaluated			TBD		
	Distribution	Lighting & Power	Contemporary	TBD	Good	No Rqmt		
	Fixtures		Period appropriate	3,4	Good	No Rqmt		
SECURITY Security		Security system	None					
FIRE DETECTION / EXTINGUISHING SYSTEMS								
Fire		Fire/smoke Detection	Cfg mounted detectors	5	Good	No Rqmt		
		Fire Alarm	None noted					
		Fire Extinguishers	In stair to Lower Level	4		No Rqmt		
ERRATTA								
		Ext satellite dishes						
INTERIOR								
CRAWL SPACE-WEST								
Interior	Crawl space-west	Ceiling	Exposed wood framing	3	Good	No Rqmt		
Interior	Crawl space-west	Flooring	None; concrete trench runs N-S in center	4	Fair	No Rqmt		
Interior	Crawl space-west	Door(s)	AP (only) in N wall	4	Fair	No Rqmt		
CRAWL SPACE-EAST								
Interior	Crawl space-east	Ceiling	Exposed wood framing	3	Good	No Rqmt		
Interior	Crawl space-east	Flooring	None	4	Fair	No Rqmt		
Interior	Crawl space-east	Door(s)	AP (only) in N wall	4	Fair	No Rqmt		
B1 - UTILITY								
Interior	B1-Utility	Ceiling	Painted plaster	3	Good	No Rqmt		
Interior	B1-Utility	N. Wall	Painted plaster	2	Good	No Rqmt		
Interior	B1-Utility	E. Wall	Painted plaster	2	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
Interior	B1-Utility	W. Wall	Painted plaster	2	Good	No Rqmt		
Interior	B1-Utility	S. Wall	Painted plaster	2	Good	No Rqmt		
Interior	B1-Utility	Flooring	Concrete-pid	5	Good	No Rqmt		
101-DINING / LIVING								
Interior	101-Din/Liv	Ceiling	GPDW	4	Good	No Rqmt		
Interior	101-Din/Liv	N. Wall	Furred GPDW	4	Good	No Rqmt		
Interior	101-Din/Liv	E. Wall	Furred GPDW	4	Good	No Rqmt		
Interior	101-Din/Liv	W. Wall	Painted Plaster	2	Good	No Rqmt		
Interior	101-Din/Liv	S. Wall	Painted Plaster	2	Good	No Rqmt		
Interior	101-Din/Liv	Window and door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
Interior	101-Din/Liv	Mouldings	Period wood mouldings	1	Good	No Rqmt		
Interior	101-Din/Liv	Base	3 piece wide base (period)	1	Good	No Rqmt		
Interior	101-Din/Liv	Flooring	Hdwd w/ area carpet	4	Good	No Rqmt		
Interior	101-Din/Liv	Cabinetry	Built-in (original) china buffet w/ wd pat int	1	Good	No Rqmt		
102-LIVING / STUDY								
Interior		Ceiling	GPDW	4	Good	No Rqmt		
		N. Wall	Painted plaster	2	Good	No Rqmt		
		E. Wall	Furred GPDW	4	Good	No Rqmt		
		W. Wall	Painted Plaster	2	Good	No Rqmt		
		S. Wall	Furred GPDW	4	Good	No Rqmt		
		Window and door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Mouldings	Period wood mouldings	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Hdwd w/ area carpet	4	Good	No Rqmt		
		Cabinetry	Contemporary wd ptd bookshelves	4	Good	No Rqmt		
		Stair newel post	Ptd solid wood w/ ball finial	1	Good	No Rqmt		
		Stair handrail	Shaped ptd wd	1	Good	No Rqmt		
		Stair bannister	Turned wd vertical spindles	1	Good	No Rqmt		
		Stair treads and risers	Carpet (contemporary)	1	Good	No Rqmt		
103-MUSIC ROOM								
Interior		Ceiling	GPDW	4	Good	No Rqmt		
		N. Wall	GPDW	4	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
104-UTILITY / BATHROOM	Interior	E. Wall	Painted Plaster	2	Good	No Rqmt		
		W. Wall	Furred GPDW	4	Good	No Rqmt		
		S. Wall	Furred GPDW	4	Good	No Rqmt		
		Window and door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Mouldings	Period wood mouldings	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Hdwd	4	Good	No Rqmt		
		Ceiling	GPDW	4	Good	No Rqmt		
		N. Wall	GPDW	4	Good	No Rqmt		
		E. Wall	GPDW	4	Good	No Rqmt		
105-KITCHEN	Interior	W. Wall	GPDW	4	Good	No Rqmt		
		S. Wall	GPDW	4	Good	No Rqmt		
		Window and door casing	Mouldings to match original	4	Good	No Rqmt		
		Base	Match profiles remainder of 1st fl	4	Good	No Rqmt		
		Flooring	Resilient tile	4	Good	No Rqmt		
		Cabinetry	Contemporary sink base (pltd)	4	Good	No Rqmt		
		Ceiling	GPDW	4	Good	No Rqmt		
		N. Wall	Furred GPDW	4	Good	No Rqmt		
		E. Wall	Painted Plaster w/ bead pattern wd wainscot	1	Good	No Rqmt		
		W. Wall	Furred GPDW	4	Good	No Rqmt		
201-STAIRHALL	Interior	S. Wall	GPDW	4	Good	No Rqmt		
		Window casing	None					
		Door casing	Match profiles remainder of 1st fl	4	Good	No Rqmt		
		Base	Match profiles remainder of 1st fl	4	Good	No Rqmt		
		Flooring	Resilient tile	4	Good	No Rqmt		
		Cabinetry	Ptd wd contemporary base & wall units	4	Good	No Rqmt		
		Ceiling	Ptd GPDW / Plaster	3	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
202-SW BEDROOM	Interior	E. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		W. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Carpet (contemporary)	4	Good	No Rqmt		
		Stair newel post	Nat solid wood w/ ball finial	1	Good	No Rqmt		
		Stair handrail	Shaped stained wd	1	Good	No Rqmt		
		Stair bannister	Turned wd vertical spindles (stained)	1	Good	No Rqmt		
		Ceiling	Ptd GPDW / Plaster	3	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		E. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
203-BATHROOM	Interior	W. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Window casing	Ptd GPDW / Plaster	1	Good	No Rqmt		
		Door casing	Period wd mldngs w/ label blocks, sills, aprons	1	Good	No Rqmt		
		Base	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Flooring	3 piece wide base (period)	1	Good	No Rqmt		
		Built-in closets	Carpet	4	Good	No Rqmt		
		Closet doors	Ptd GPDW / Plaster	3	Good	No Rqmt		
			2 over 2 wd rail & stile (stained)	1	Good	No Rqmt		
		Ceiling	Ptd GPDW / Plaster	4	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	4	Good	No Rqmt		
		E. Wall	Ptd GPDW / Plaster	4	Good	No Rqmt		
		W. Wall	Ptd GPDW / Plaster	4	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	4	Good	No Rqmt		
		Door casing	Contemporary pld wood	4	Good	No Rqmt		
		Base	1x8 flat pld wood	4	Good	No Rqmt		
		Flooring	Resilient sheet vinyl	4	Good	No Rqmt		
		Cabinetry	Contemporary sink base	4	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
204-NW BEDROOM Interior		Ceiling	Ptd GPDW / Plaster	3	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		E. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		W. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Window casing	Period wd mldngs w/ label blocks, sills, aprons	1	Good	No Rqmt		
		Door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Carpet	4	Good	No Rqmt		
		Built-in closets	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Closet doors	2 over 2 wd rail & stile (stained)	1	Good	No Rqmt		
205-NE BEDROOM Interior		Ceiling	Ptd GPDW / Plaster	3	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		E. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		W. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Window casing	Period wd mldngs w/ label blocks, sills, aprons	1	Good	No Rqmt		
		Door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Carpet	4	Good	No Rqmt		
		Built-in closets	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Closet doors	2 over 2 wd rail & stile (stained)	1	Good	No Rqmt		
206-SE BEDROOM Interior		Ceiling	Ptd GPDW / Plaster	3	Good	No Rqmt		
		N. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		E. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		W. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		S. Wall	Ptd GPDW / Plaster	3	Good	No Rqmt		
		Window casing	Period wd mldngs w/ label blocks, sills, aprons	1	Good	No Rqmt		

PRIORITIZED WORK PLAN - PRESERVATION PLAN - RESIDENCE

Note: Carriage House / Livery / Garage is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
		Door casing	Period wood mouldings w/ label blocks	1	Good	No Rqmt		
		Base	3 piece wide base (period)	1	Good	No Rqmt		
		Flooring	Carpet	4	Good	No Rqmt		
		Built-in closets	Pld GPDW / Plaster	3	Good	No Rqmt		
		Closet doors	2 over 2 wd rail & stile (stained)	1	Good	No Rqmt		
INTERIOR DOORS								
Interior doors		101B	Opening only; door has been removed	1	Good	No Rqmt		
Interior doors		103B	Opening only; door has been removed	1	Good	No Rqmt		
Interior doors		104A	Contemporary pld slab door 2/2 pnl stained rail & stile w/ operable transom	4	Good	No Rqmt		
Interior doors		210A	2/2 pnl stained rail & stile w/ operable transom	1	Good	No Rqmt		
Interior doors		201B	2/2 pnl stained rail & stile w/ operable transom	1	Good	No Rqmt		
Interior doors		201C	2/2 pnl stained rail & stile w/ operable transom	1	Good	No Rqmt		
Interior doors		202A	2/2 pnl stained rail & stile w/ operable transom	1	Good	No Rqmt		
Interior doors		204A	2/2 pnl stained rail & stile w/ operable transom	1	Good	No Rqmt		
Interior doors		BI-fold storage doors; Rm 105 corridor	Contemporary pld wd pnl doors	4	Good	No Rqmt		

CARRIAGE HOUSE PRESERVATION PLAN

PRIORITIZED WORK PLAN - PRESERVATION PLAN- Carriage / Livery / Garage

Note: U. S. Commissioner's House is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION
See material inventory of U. S. Commissioner's House for site descriptions and tabulations except for drainage noted below.								
ROOF ASSEMBLY								
Roof		Roof surfacing	Wd shingle (or missing)	3	Very Poor	Critical	1.01	Replace
Roof		Ridges	1x wd ridge (or missing)	3	Very Poor	Critical	1.02	Replace
Roof		Sheathing	3/4" wd boards - S2S	2	Fair	TBD	1.03	Replace as reqd
FOUNDATION								
Foundation		Perimeter	Unknown (may be timbers)	5	TBD	Critical	2.01	Verify
SITE								
Drainage			Negative drainage along west side				2.02	Re-shape
EXTERIOR WINDOWS								
E wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	2	Poor	Critical	3.01	Rehabilitate
S wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	2	Poor	Critical	3.02	Rehabilitate
N wall		4 lite (2/2) fixed wood sash	Original wd sash, frames, and hardware	2	Poor	Critical	3.03	Rehabilitate
EXTERIOR DOORS								
E. entrance		4 pnl wd (2/2) wd door	True rail and stile w/ molded stops (original)	1	Poor	Serious	3.04	Rehabilitate
W. passage		wd plank sliding door	Oversize for animal passage	1	Fair to poor	Serious	3.05	Rehabilitate
E. equipment dr		wd plank sliding door	9' door for vehicles or animals; iron track	1	Fair to poor	Serious	3.06	Rehabilitate
W. hatch		wd plank hatch at grade	Cleaning access (original)	1	Poor	Serious	3.07	Rehabilitate
EXTERIOR WALLS								
East Wall		Perimeter sealants	Various materials	5	Poor	Serious	3.08	Replace
		Perimeter sealants	Various materials	5	Poor	Serious	3.09	Replace
		Perimeter sealants	Various materials	5	Poor	Serious	3.10	Replace
		Perimeter sealants	Various materials	5	Poor	Serious	3.11	Replace
South Wall		Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor	4.01	Prep and paint
		Corner boards	1x4 flat wd; pld	2	Fair	minor	4.02	Prep and paint
West Wall		Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor	4.03	Prep and paint
		Corner boards	1x4 flat wd; pld	2	Fair	minor	4.04	Prep and paint
North Wall		Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor	4.05	Prep and paint
		Corner boards	1x4 flat wd; pld	2	Fair	minor	4.06	Prep and paint
		Siding	Drop lapped wd siding; approx. 5" exp.	2	Fair	minor	4.07	Prep and paint

PRIORITIZED WORK PLAN - PRESERVATION PLAN- Carriage / Livery / Garage

Note: U. S. Commissioner's House is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST RTG	COND	PRIORITY	PR NO.	ACTION	
See material inventory of U. S. Commissioner's House for site descriptions and tabulations except for drainage noted below.									
	Ext wdw casing	All	Corner boards	1x4 flat wd; pld	2	Fair	minor	4.08	Prep and paint
	Roof		Wd 1x4; flat	Butted corners; projecting sill; no apron	2	Fair	minor	4.09	Prep and paint
	Roof		Frieze Board	1x wd; flat, painted	2	Fair	minor	4.10	Prep and paint
	Roof		Soffit	Exposed rafter tails	2	Fair	minor	4.11	Prep and paint
Ext dr casing	All	Wd 1x4; flat	Butted corners	2	Fair	minor	4.12	Prep and paint	
INTERIOR									
CARRIAGE STORAGE G-1									
Interior									
		Ceiling	Exposed rafters and sheathing (natural)	2	Good	minor			
		N. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		E. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		W. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		S. Wall	Partition w/ wd siding finish (natural)	2	Good	minor			
		Flooring	Wood planking	2	Fair	minor			
		Casing & Trims	Flat 1x4 wd @ door to Tack Room	2	Good	minor			
TACK ROOM G-2									
Interior									
		Ceiling	Ceiling joists w/ wd siding over (natural)	2	Good	minor			
		N. Wall	Wood siding (horizontal) - natural finish	2	Good	minor			
		E. Wall	Wood siding (horizontal) - natural finish	2	Good	minor			
		W. Wall	Wood siding (horizontal) - natural finish	2	Good	minor			
		S. Wall	Wood siding (horizontal) - natural finish	2	Good	minor			
		Flooring	Wood planking	2	Fair	minor			
		Door(s) - passage into Carriage space	True rail and stile w/ molded stops (original)	1	Fair	minor			
		Casing & Trims	Flat 1x4 wd @ door to Tack Room	2	Good	minor			
STALL G-3									
Interior									
		Ceiling	Exposed rafters and sheathing (natural)	2	Good	minor			
		N. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		E. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		W. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		S. Wall	Exposed wood studs and sheathing (natural)	2	Good	minor			
		Flooring	Wood planking	2	Fair	minor			
		Door(s)	Wood gate only	2	Good	minor			

STALL / FEED (ADJ TO G-3)

PRIORITIZED WORK PLAN - PRESERVATION PLAN- Carriage / Livery / Garage

Note: U. S. Commissioner's House is tabulated separately

CAT	LOCATION	ELEMENT	DESCRIPTION	HIST		COND	PRIORITY	PR NO.	ACTION
				RTG					
See material inventory of U. S. Commissioner's House for site descriptions and tabulations except for drainage noted below.									
Interior									
		Ceiling	Exposed rafters and sheathing (natural)	2		Good	minor		
		N. Wall	Exposed wood studs and sheathing (natural)	2		Good	minor		
		E. Wall	Exposed wood studs and sheathing (natural)	2		Good	minor		
		W. Wall	Exposed wood studs and sheathing (natural)	2		Good	minor		
		S. Wall	Exposed wood studs and sheathing (natural)	2		Good	minor		
		Flooring	Wood planking	2		Fair	minor		
		Door(s)	See exterior doors						
		Door(s)	Wood gate only	2		Good	minor		

PART 3: RECORD OF TREATMENT

Prescription Treatment and Recommendations

THESE RECORDS WILL BE MAINTAINED BY THE

U.S. DEPARTMENT OF HEALTH

AND HUMAN SERVICES AT THE U.S. DEPARTMENT OF HEALTH

AND HUMAN SERVICES

U.S. DEPARTMENT OF HEALTH

U.S. DEPARTMENT OF HEALTH

PART 3: RECORD OF TREATMENT

Preservation Treatment and Recommendations

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TO BE COMPLETED

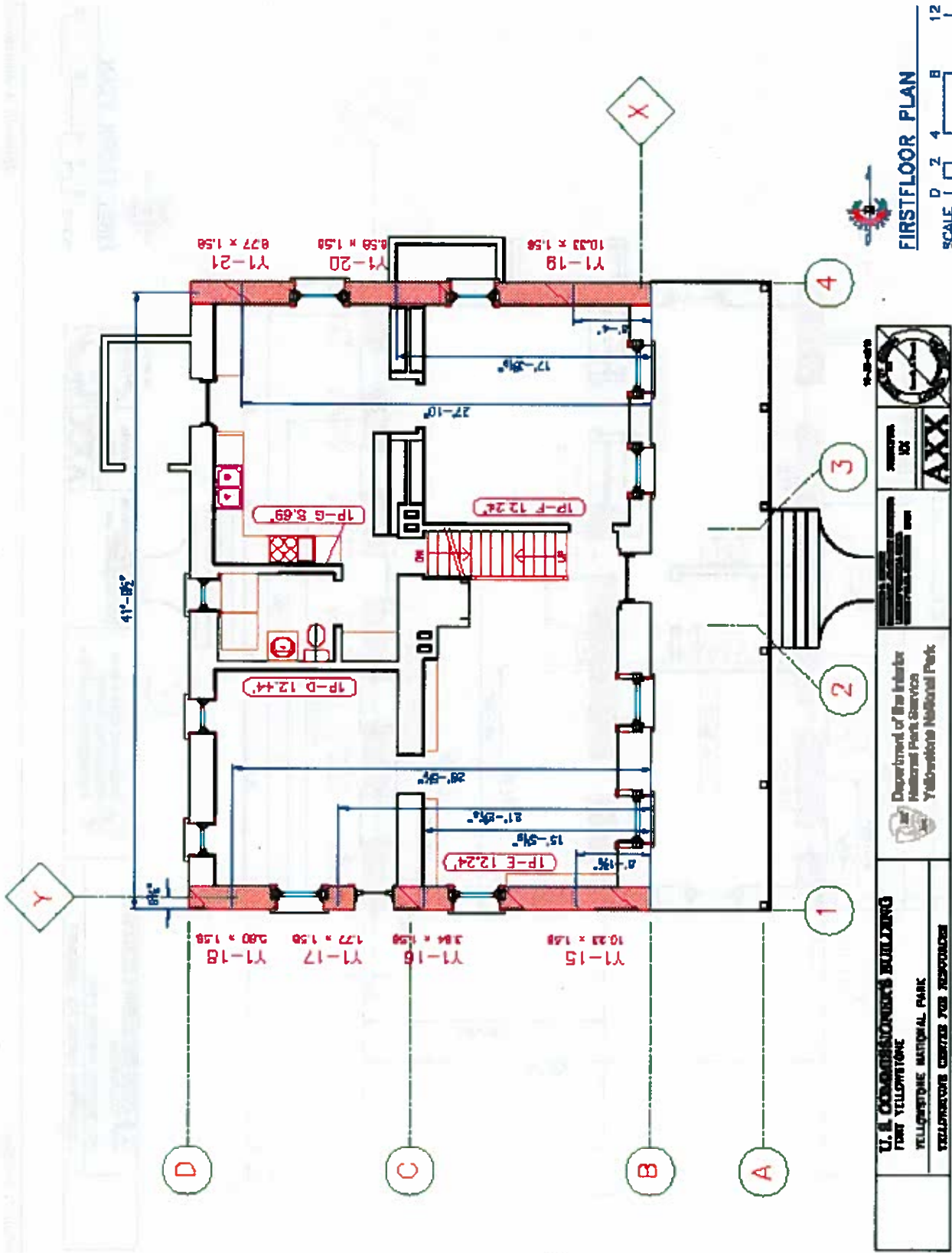
WHEN WORK IS IMPLEMENTED AT THE U.S. COMMISSIONER'S HOUSE

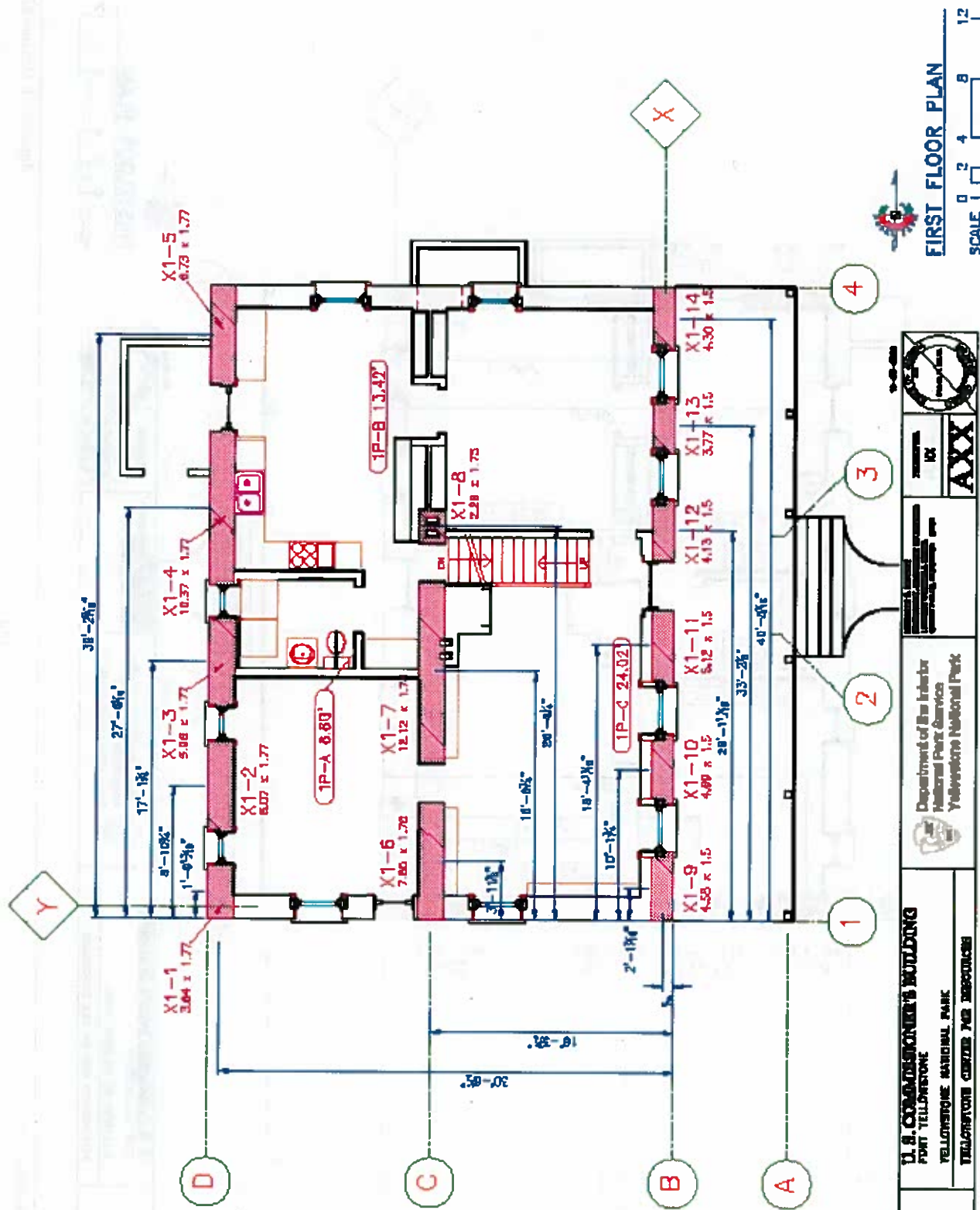
I. Completion Report

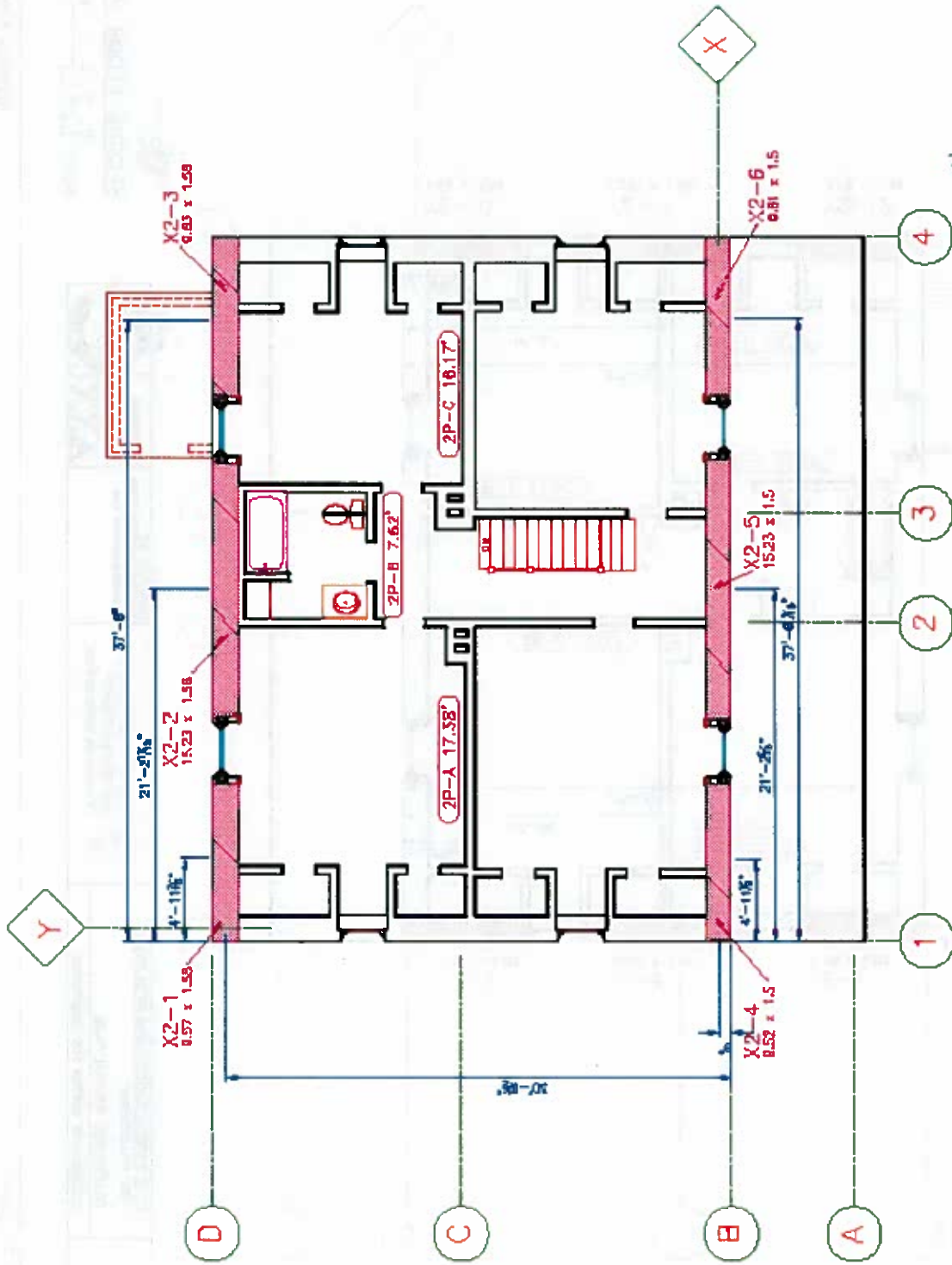
II. Technical Data

APPENDIX A MEASURED DRAWINGS

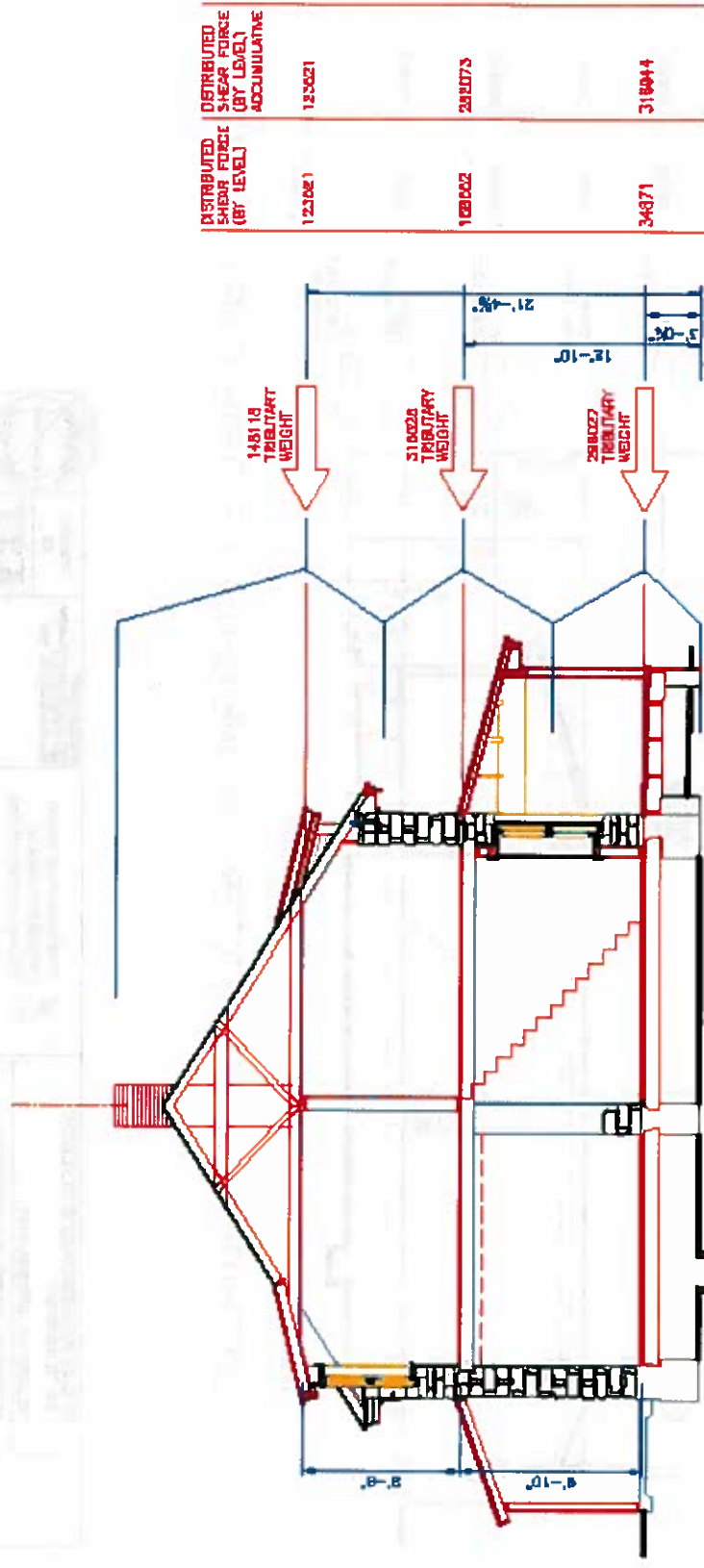








SECOND FLOOR PLAN
SCALE 0 2 4 8 12

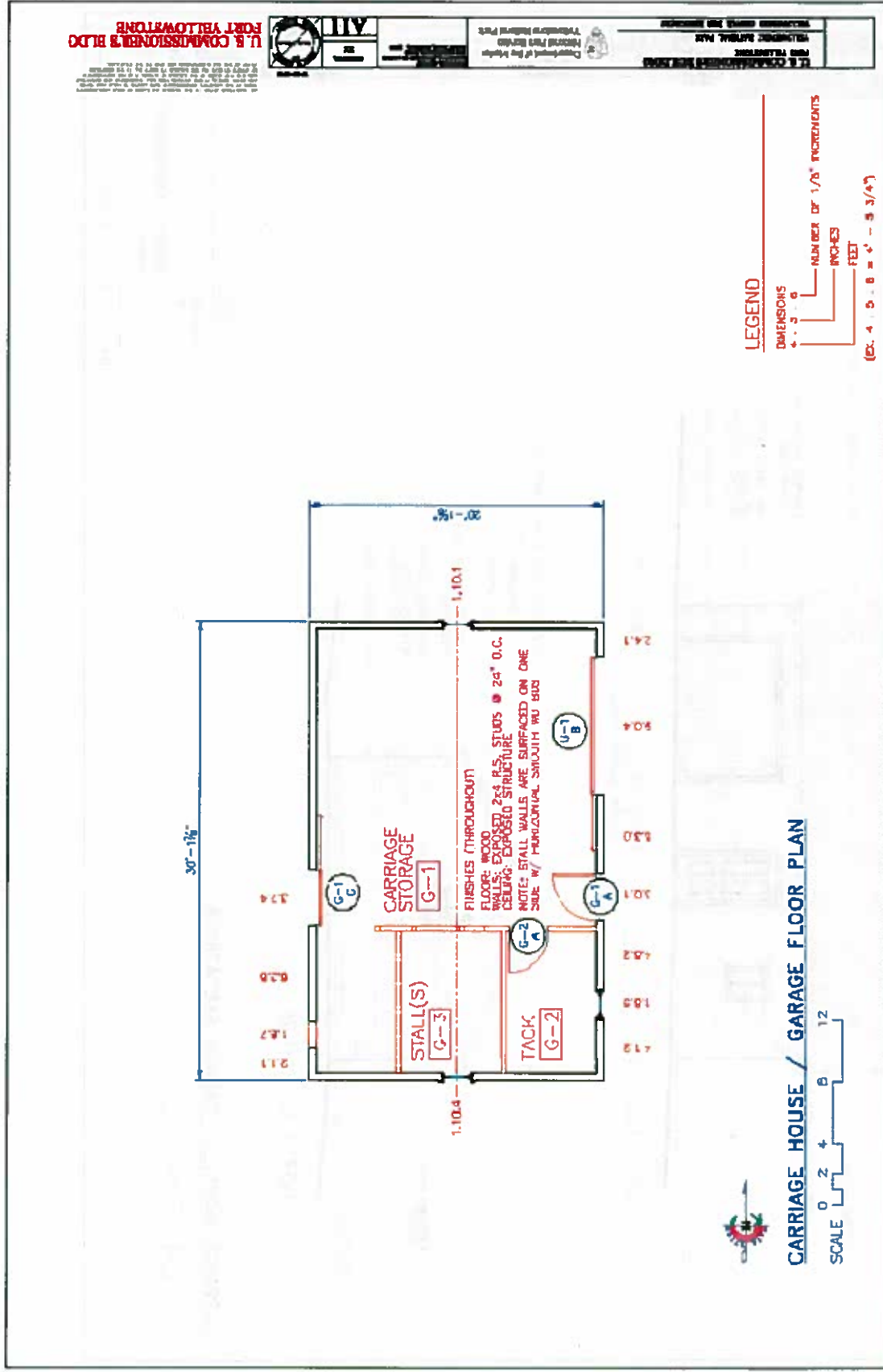


FORMULAS AND DISTRIBUTION CALCULATIONS ARE ATTACHED WITHIN THE REPORT

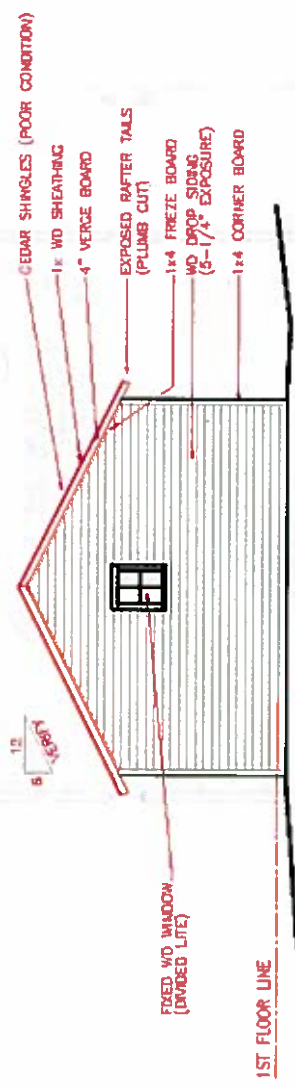
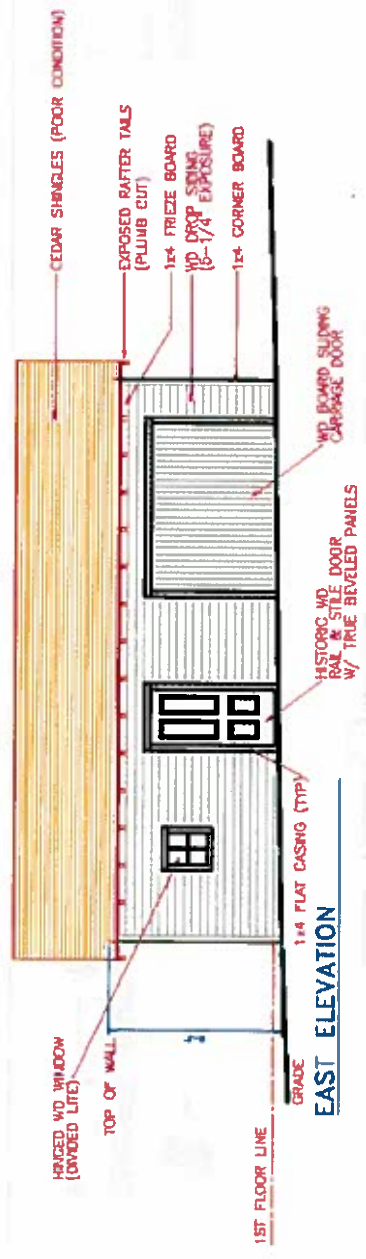
DISTRIBUTION AT LEVELS OF DIAPHRAGMS (IDEALIZED)

U.S. COMMISSIONER'S BUILDING PORT TELLURIDE YELLOWSTONE NATIONAL PARK YELLOWSTONE CENTER FOR RESEARCH	 Department of the Interior National Park Service Yellowstone National Park	 AXX	

MEASURED DRAWINGS OF CARRIAGE HOUSE



U.S. COMMISSIONER'S BLDG
PORT YELLOWSSTONE



NORTH ELEVATION

CARRIAGE HOUSE / GARAGE ELEVATIONS



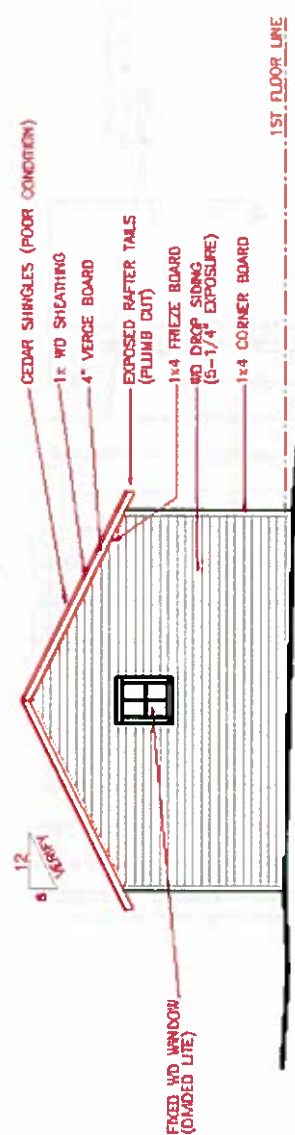
LEGEND

DIMENSIONS
4 5 6

NUMBER OF 1/8" INCREMENTS
INCHES
FEET
(EX. 4 5 6 = 4' - 5 3/4")



WEST ELEVATION



SOUTH ELEVATION

CARRIAGE HOUSE / GARAGE ELEVATIONS

SCALE 0 2 4 6 8 12

LEGEND

4	5	5
DIMENSIONS		
4	5	5
NUMBER OF 1/8\"/>		

APPENDIX B RESEARCH EVALUATION (PRELIMINARY)

The following is a preliminary evaluation of the research project and its findings. The purpose of this evaluation is to provide a summary of the research project and its findings, and to provide a preliminary assessment of the research project and its findings.

The research project was conducted in the field of research and development. The purpose of the research project was to investigate the relationship between the research project and its findings. The research project was conducted in the field of research and development.

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APPENDIX B

SEISMIC EVALUATION (PRELIMINARY)

This appendix consists of a trial evaluation of lateral strengths, weaknesses, and vulnerabilities of the U. S Commissioner's House in Mammoth, YNP.

The method selected for this evaluation is the "Equivalent Static Force" method identified in building codes and referenced standards. This method was selected because the U. S. Commissioner's House does not exhibit ductile properties that lend themselves to other types of lateral analysis.

For simplicity this evaluation did not consider secondary effects from furring within the exterior walls, interior partitions (wood framed), or the two central chimneys. In addition, the determination of shear wall geometry considered all window and door openings thereby limiting the length of some of the resisting shear elements.

Although this evaluation is preliminary and subject to further refinement, some general conclusions can be derived regarding the structure.

- a. The structure would be most vulnerable to damage from an earthquake that was traveling in an E-W path of travel.

- b. Preliminary analysis indicates that the most highly stressed walls during a seismic event are the first floor shear walls located on the north and south ends of the structure. Calculated stresses exceed allowable values for safety and these walls are therefore the most likely to fail.

- c. If an earthquake of a magnitude shown on the NESHAP maps were to occur and it was oriented E-W, then the structure would be at risk as noted above. The referenced maps are adopted by building codes, and are based upon statistical probability from what is known of area geology.

- d. Elements that are identified as being deficient (subject to confirmation from further analysis) could be strengthened from the interior by incorporating shear plates or shear braces, and then concealed to match existing finishes.

Based upon this preliminary evaluation, it is recommended that further analysis be implemented, and that strategies to introduce additional seismic resistance into the structure be developed.

SEISMIC FACTORS - IBC 2006 (ASCE 7-05)					
PROJECT: U.S. Commissioner's House; Mammoth; YNP					Incomplete -
DATE: August 6, 2009					subject to review
Occupancy Category / Importance Factor	☒ I	Ie =	1.00		
(ASCE table 1-1 & 11.5.1)	☐ II	Ie =	1.25		
	☐ III	Ie =	1.50		
Site Class:	☐ A				
	☐ B				
	☐ C				
	☐ D				
	☐ E				
	☐ F				
Assumed Class (ASCE 11.4.2)	☒ D				
Soil properties unknown					
Spectral Response (from NEHRP) - MCE					
Ss (0.2 sec-site B - 5%)	=	1.25 g	Short Period Acceleration		
S1 (1.0 sec-site B - 5%)	=	0.5 g	(1) Second Acceleration		
Site Coefficient Fa (ASCE table 11.4-1)	=	1			
Site Coefficient Fv (ASCE table 11.4-2)	=	1.5			
Maximum Considered Earthquake (adjusted) Sms	=	1.25	Fa(Ss)	(ASCE 11.4.3)	
Maximum Considered Earthquake (adjusted) Sm1	=	0.75	Fv(S1)		
Design Earthquake (short period) SDs=2/3 Sms	=	0.833		(ASCE 11.4.4)	
Design Earthquake (short period) SD1=2/3 Sm1	=	0.5			
SEISMIC DESIGN CATEGORY					
For Short Period Response Structures	☐ A	minimal risk			
(ASCE table 11.6-1)	☐ B	low-to-moderate risk			
	☐ C	moderate risk			
	☒ D	high risk			
	☐ E	high risk-near source			
	☐ F	high risk-near source			
For 1-sec. Period Response Structures	☐ A	minimal risk			
(ASCE table 11.6-2)	☐ B	low-to-moderate risk			
do	☐ C	moderate risk			
do	☒ D	high risk			
Occ I, II, III w/ S1 > 0.75	☐ E	high risk-near source			
Occ IV, w/ S1 > 0.75	☐ F	high risk-near source			
Design Response Spectrum - MCE					
Period Of Vibration					
Fundamental Period T:					
(ASCE 12.8.2.1) Ta = Ct x hnx					
Height of structure	23.00				
Ct from table 12.8-2	0.02	(hn)3/2 =	110.304125		
x from table 12.8-2	0.75	(hn)3/4 =	10.50257707		
category: all other structural systems					
Calculated - Ta = T =	0.21				
To = 0.2 x SD1/SDS	0.12				
Ts = SD1 / SDS	0.60				
TL = (see figure 22-15 in chapter 22)	6.00				
Design Response Spectrum					
Acceleration Sa; T < To					
Sa = SDS(0.4 + 0.6 T/To)	☐	1.450258			
Acceleration Sa; To < T < Ts					
Sa = SDS	☒	0.833			
Acceleration Sa; Ts < T < TL					
Sa = SD1/T	☐	2.38038			
Acceleration Sa; TL < T					
Sa = SD1 x TL / T x T	☐	67.99417			

SEISMIC ANALYSIS PART II: PROCEDURE - ASCE 7-05

PROJECT: U. S. Commissioners House; Mammoth, YNP

DATE: 17-Aug-09

The following table is reproduced from ASCE 7-05. ASCE 7-05 is the reference standard for IBC 2006

TABLE 12.6-1 PERMITTED ANALYTICAL PROCEDURES

Seismic Design Category	Structural Characteristics	Equivalent Lateral Force Analysis Section 12.8	Nodal Response Spectrum Analysis Section 12.9	Seismic Response History Procedures Chapter 16
B C	Occupancy Category I or II buildings of light framed construction not exceeding 3 stories in height	P	P	P
	Other Occupancy Category I or II buildings not exceeding 2 stories in height	P	P	P
	All other structures	P	P	P
D E F	Occupancy Category I or II buildings of light framed construction not exceeding 3 stories in height	P	P	P
	Other Occupancy Category I or II buildings not exceeding 2 stories in height	P	P	P
	Regular structures with $T < 3.5T_s$ and all structures of light frame construction	P	P	P
	Irregular structures with $T < 3.5T_s$ and having only horizontal irregularities Type 2, 3, 4, or 5 of Table 12.3-1 or vertical irregularities Type 4, 5a, or 5b of Table 12.3-2	P	P	P
	All other structures	NP	P	P

NOTE: P: Permitted; NP: Not Permitted

SDS =

Enter From Previous Calculation

SD1 =

Enter From Previous Calculation

$T_s = SD1 / SDS =$

$3.5 T_s =$

$T =$

Enter From Previous Calculation

Is T less than $3.5 T_s$?

Yes ☒

No ☐

As shown on the table, the U. S. Commissioners House structure can be analyzed by using the Equivalent Lateral Force Analysis procedure since it is a category I building that does not exceed 2 stories in height.

U.S. Commissioner's House; Mammoth; YNP		
AUG 17, 2009		

Total Base Shear Coefficient

(from previous page)

VCO=	0.4185
------	--------

(See attached diagram)

(undistributed)

(See attached diagram)

(undistributed)

1	VR=	44211	18413.8815
2	VW2=	207814	86554.531
3	VF2=	32612	13582.898
4	VW1=	353436	147206.084
5	VF1=	122897	51186.6005
6	VFG=	0	0

TOTAL	VWT=	760970
-------	------	--------

TOTAL BASE

316944.005

316944.005

(from calculation)

File	
------	--

--	--

V - Ft =	316944 01
----------	-----------

--	--

	MK	COMPONENT	WEIGHT	DISTANCE	WxH	(V-Ft)	Fx	FORCE	FORCE (ACCUMULATIVE)
			(LB)	TO GROUND					BY LEVEL
	1	VR	44211	21.38	945231.18	316944.01	2.99585E+11	37010.09	37010.0934
	2	VW2	207814	17.10	3553619.4	316944.01	1.1263E+12	139140.3	176150.4314
	3	VF2	32612	12.63	418411.96	316944.01	1.32613E+11	16382.73	192383.1599
	4	VW1	353436	7.84	2806281.8	316944.01	8.89434E+11	109878.7	302411.8385
	5	VF1	122897	3.02	371148.94	316944.01	1.17633E+11	14532.17	316944.005
	6	VFG	0	0.00	0				

8094693.3

SEISMIC ANALYSIS PART IV: DISTRIBUTION OF EARTHQUAKE FORCE - (ASCE 7-05)									
U.S. Commissioner's House; Mammoth; YNP									
AUG 17, 2009									
DISTRIBUTION AT LEVEL OF DIAPHRAGMS (IDEALIZED)									
Total Base Shear Coefficient									
(from previous page)									
	VCO=	0.4165							
Seismic Weight Of Building - By Level									
(See attached diagram)									
1	VR=	148118	61691.147						
2	VF2=	316825	131957.6125						
3	VF1=	296027	123295.2455						
4	VFG=	0	0						
TOTAL	VWT=	760970							
TOTAL BASE SHEAR		316944.005	316944.005						
Force at Top (Whiplash)									
(from calculation)									
	Ft=	0.00							
	V - Ft =	316944.01							
DISTRIBUTION MATRIX									
	MK	COMPONENT	WEIGHT (LB)	DISTANCE TO GROUND	WxH	(V-Ft)	Fx	FORCE	FORCE (ACCUMULATIVE)
									BY LEVEL
1	VR	148118	21.38	3166762.84	316944.01	1.00369E+12	123521.1	123521	
2	VF2	316825	12.83	4064864.75	316944.01	1.28833E+12	158552	282073	
3	VF1	296027	3.02	894001.54	316944.01	2.83348E+11	34870.95	316944	
4	VFG	0	0.00	0					
				8125629.13					
OVERTURNING									
			DISTRIBUTED	hi	OTM		OTM		
			FORCE	FT	F1 x h1		(ACCUMULATIVE)		
			F1		ft-lb		BY LEVEL		
1	VR	123521	21.38	2640878.98		2640879			
2	VF2	282073	12.83	3618996.59		6259876			
3	VF1	316944	3.02	957170.88		7217046			
4	VFG	316944	0.00	0		0			

U. S. Commissioners House; Mammoth, YNP
8/18/08

CENTER OF MASS - FLOORS & ROOF ONLY (BY INSPECTION); NOTE: ALL FLOORS ARE ALIKE

X=	20.51	WT x Dx	WT x Dy
Y=	14.90		
Roof WT	44211.00	658743.90	906767.61
2nd Floor WT	32612.00	485918.80	668872.12
1st Floor WT	122897.00	1831165.30	2520617.47

CENTER OF MASS - PARTITIONS (BY FLOOR)

Lower Level	WALL NUMBER	LENGTH	HT.	UNIT WEIGHT	TOTAL WEIGHT	Dx dist to X	Dy dist to Y	WT x Dx	WT x Dy		
	BP-A	13.19	8.00	13.33	1408.58	28.48	33.69	40059.44	47367.73		
	BP-B	12.63	8.00	13.33	1346.86	7.73	21.31	10411.25	28701.65	X=	32.52
	BP-C	12.27	8.00	13.33	1308.47	22.55	27.31	29506.06	35734.39	Y=	17.61
	BP-D	28.38	8.00	13.33	2813.15	14.80	39.72	41072.18	111738.84		
					6875.08			121048.94	223562.62		
First Floor	1P-A	8.60	9.83	13.33	864.82	20.53	18.92	17754.83	16362.47		
	1P-B	13.42	9.83	13.33	1758.47	15.83	33.32	27836.66	58592.38		
	1P-C	24.02	9.83	13.33	3147.43	1.14	10.00	3586.08	31474.34		
	1P-D	12.44	9.83	13.33	1630.08	22.64	15.31	36904.60	24956.24	X=	16.93
	1P-E	12.24	9.83	13.33	1603.85	7.65	1.24	12269.49	1988.78	Y=	11.78
	1P-F	12.24	9.83	13.33	1603.85	7.33	25.05	11756.26	40176.57		
	1P-G	8.69	9.83	13.33	1138.68	24.60	22.22	28011.64	25301.57		
					11747.19			138121.55	198852.36		
Second Floor	2P-A	17.38	8.50	13.33	1989.24	15.02	9.31	29578.00	18333.63		
	2P-B	7.62	8.50	13.33	863.38	21.05	22.44	18174.24	19374.34		
	2P-C	18.17	8.50	13.33	1832.14	15.06	32.88	27592.06	60240.82		
	2P-D	28.30	8.50	13.33	3208.53	14.90	3.35	47777.32	10741.88	X=	20.81
	2P-E	28.30	8.50	13.33	3208.53	14.90	18.37	47777.32	58903.98	Y=	15.20
	2P-F	13.92	8.50	13.33	1577.21	7.53	25.02	11876.36	39461.68		
	2P-G	13.58	8.50	13.33	1538.68	22.06	22.50	33943.32	34820.34		
	2P-H	28.30	8.50	13.33	3208.53	14.90	37.53	47777.32	120341.13		
					17400.25			264485.93	362017.81		

CENTER OF MASS - SHEAR WALLS (BY FLOOR)

See Separate Tabulation of Shear Walls

		WALL AREA	WALL WT	WT x Dy (SUM)	WT x Dx (SUM)		
First Floor	X-DIR	136.84	17105.36	326085.50	304584.80	X=	20.19
	Y-DIR	70.08	8759.40	196158.69	129184.07	Y=	16.77
			25864.76	522244.19	433768.87		
Second Floor	X-DIR	106.05	13256.25	282009.69	212939.71	X=	21.37
	Y-DIR	78.04	9755.00	209769.82	153694.03	Y=	15.93
			23011.25	491779.51	366633.74		
Lower Level	X-DIR	191.06	23995.00	465620.24	379373.83	X=	19.58
	Y-DIR	103.67	12958.75	258089.52	222837.21	Y=	16.30
			36953.75	723709.76	602211.04		

COMBINED CENTER OF MASS - FLOORS, PARTITIONS, & SHEAR WALLS (BY FLOOR)

		WT	WT x Dy		WT	WT x Dx		
First Floor	Sh Walls	25864.76	522244.19	Y-DIR	25864.76	433768.87	X=	19.79
	Partitions	11747.19	198852.36		11747.19	138121.55	Y=	15.06
	Floor	32612.00	668872.12		32612.00	485918.80		
		70223.95	1389968.670		70223.95	1057809.22		
Second Floor	Sh Walls	23011.25	491779.510	Y-DIR	23011.25	366633.74	X=	20.80
	Partitions	17400.25	362017.81		17400.25	264485.93	Y=	15.24
	Floor	44211.00	906767.61		44211.00	658743.90		
		84622.50	1760564.93		84622.50	1288873.57		
Lower Level	Sh Walls	36953.75	723709.76	Y-DIR	36953.75	602211.04	X=	20.80
	Partitions	6875.08	223562.62		6875.08	121048.94	Y=	15.32
	Floor	122897.00	2520617.47		122897.00	1831165.30		
		166725.83	3467889.850		166725.83	2554425.28		

COMBINED CENTER OF MASS - ALL ELEMENTS; ALL FLOORS

Total Weight	321572.28	X=	20.58
Total WT x Dy	6618423.45		
Total WT x Dx	4902108.07	Y=	15.24

CENTER OF RIGIDITY OF SHEAR WALLS			Existing Conditions	
<u>First Floor:</u>				
X-DIR=	$\frac{R \times 'X'}{R_y}$	= $\frac{4873.29}{201.92}$	= 24.13	Checked
Y-DIR=	$\frac{R \times 'Y'}{R_x}$	= $\frac{7040.55}{362.06}$	= 19.45	Checked
<u>Second Floor</u>				
X-DIR=	$\frac{R \times 'X'}{R_y}$	= $\frac{10251.03}{476.17}$	= 21.53	Checked
Y-DIR=	$\frac{R \times 'Y'}{R_x}$	= $\frac{11125.69}{691.54}$	= 16.08	Checked
<u>Lower Level</u>				
X-DIR=	$\frac{R \times 'X'}{R_y}$	= $\frac{8846.25}{842.45}$	= 10.50	Checked
Y-DIR=	$\frac{R \times 'Y'}{R_x}$	= $\frac{36592.78}{2280.12}$	= 16.05	Checked

CONVENTION

Rx = sum of the rigidities in the 'X' axis direction (sum X1 thru Xx)

Ry = sum of the rigidities in the 'Y' axis direction (sum Y1 thru Yx)

R x 'Y' = sum of R x distance to 'X' (i.e. R x Y) - may be expressed as R x Dx

R x 'X' = sum of R x distance to 'Y' (i.e. R x X) - may be expressed as R x Dy

SEISMIC ANALYSIS PART III: EARTHQUAKE FORCE - (ASCE 7-05)			
SEISMIC - IBC-EQUIVALENT STATIC FORCE PROCEDURE - (STATIC)			
PROJECT: U. S. Commissioners House; Mammoth, YNP			
DATE:	August 17, 2009		
STRUCTURE PERIOD (T) - (APPROXIMATE FORMULA METHOD)			
Coefficient Ct:			
Steel Moment Frames; Ct = ...	0.035		
Concrete Moment Frames; Ct = ...	0.03		
Eccentrically Braced Steel Frames; Ct = ...	0.03		
All Other Buildings; Ct = ...	0.02	0.02	
Ct selected for use on this structure =	0.02		
Height of Structure (hn) = ...	23	(hn) ^{3/2} =	110.3041
		(hn) ^{3/4} =	10.50258
Structure Period T = Ct(hn) ^{3/4} = ...	0.21		
STRENGTH / DUCTILITY COEFFICIENT FOR SELECTED LATERAL RESISTING SYSTEM (R)			
Response Modification Coefficient R =	2.00		
Source: Table 12.12-1 ASCE 7-05			
IMPORTANCE FACTOR (Ie) from previous page =	1.00		
DESIGN EARTHQUAKE FACTOR (SDS) previous page =	0.833	Short Period Response	
DESIGN EARTHQUAKE FACTOR (SD1) previous page =	0.5	1 - sec. Response	
SEISMIC RESPONSE COEFFICIENT (Cs)			
Basic: Cs = SDS / (R / Ie)	0.4165	R / Ie =	2.00
Limit: need not exceed SD1 / (R / Ie)(T)	1.190184		
Limit: may not be less than 0.044(SDS)(Ie)	0.036652		
For SDC of either E or F:			
Enter S1 from previous page =	0		
Cs = (0.5)(S1) / (R / Ie) =	0		
APPLICABLE Cs TO BE USED FROM ABOVE PROCEDURE =		0.4165	
DESIGN BASE SHEAR			
Basic Calculation: V = CsW			
SEISMIC WEIGHT of building from previous tabulation =		760970	
Design Base Shear this structure =		316944.005	

U. S. Commissioners House, Mammoth
aug 27-09

SHEAR WALLS - LOAD DISTRIBUTION
FIRST FLOOR : N-S EARTHQUAKE
SHEAR THIS FLOOR =

(code)= 1.5
TORSIONAL MOMENT =
OVERTURNING MOMENT Mot = 7217046
CENTER OF RIGIDITY;
Xcr= 24.13 dist to 'Y' axis
Ycr= 19.45 dist to 'X' axis

THIS PROJECT:
Y-DIR IS E-W
X-DIR IS N-S

316944 IBC(06) 2106.5.1
475416
316944 (x) 4.21 (=)

Note: have to enter numerical values in columns noted with

Torsional Shear is calculated parallel to the direction of the earthquake; i.e. torsional calculation uses distance between the principal center of rigidity (in direction of walls) and the centroid of the respective walls - times the torsional moment

Note: Torsional Moment is calculated in direction of earthquake

FORMUL: Fv = Vmod (x) R/sum R

Y-WALL Flor = R(dnx)/(sum R(dnx)(dny)) x (Mt)

X-WALL Flor = R(dny)/(sum R(dny)(dny)) x (Mt)

WALL	DIR	LGTH	HT.	TH	r'	H/L RIGIDITY			TO Y		TO X		L times	L times	L times	dist to Y	dist to X	R times	R times	R times	dist to X	dist to Y	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy	R x Dx	R x Dy
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SHEAR WALLS - LOAD DISTRIBUTION
FIRST FLOOR : N-S EARTHQUAKE

WALL	DIR	LGTH	HT.	TH	H/L	RIGIDITY	% R	Dy	Dx	L times	L times	L times	R times	R times	R times	dnx is dnt		R(dnx)(dnt)	Fv	Flor	Ft	OTM	STR
																to X	to Y						
L'								dist to Y	dist to X	L x Dy	L x Dx	L x Dy	R x Dy	R x Dx	R x Dy	R x Dx	Dx-Ycr	Dy-Xcr	enter	enter	enter	enter	PSI
Y1-15	Y	10.23	9.00	18.75	0.88	3.011	56.456	0.280	0.77	5.11	7.88	52.28	43.47				-23.36	-1318.82	30807.5885	-13466	-13466	-13466	-5.9
Y1-16	Y	3.64	9.00	18.75	2.47	0.445	8.344	0.041	0.77	15.43	2.80	56.17	6.42				-23.36	-194.91	4553.0976	-1990	-1990	-1990	-2.4
Y1-17	Y	1.77	9.00	18.75	5.08	0.068	1.275	0.006	0.77	21.21	1.36	37.54	0.98				-23.36	-29.78	695.75424	-304	-304	-304	-0.8
Y1-18	Y	5.60	9.00	18.75	1.61	1.111	20.831	0.103	0.77	28.44	4.31	159.26	16.04				-23.36	-486.62	11367.3965	-4969	-4969	-4969	-3.9
Y1-19	Y	10.33	9.00	18.75	0.87	3.060	57.375	0.284	41.79	5.33	431.69	55.06	2397.70				17.66	1013.24	17893.8626	10346	10346	10346	4.5
Y1-20	Y	6.58	9.00	18.75	1.37	1.497	28.069	0.139	41.79	17.29	274.98	113.77	1172.99				17.66	495.69	8753.95825	5061	5061	5061	3.4
Y1-21	Y	6.77	9.00	18.75	1.33	1.577	29.569	0.146	41.79	27.83	282.92	188.41	1235.68				17.66	522.18	9221.77165	5332	5332	5332	3.5
							201.919	1.000					4873.29						83293.4292				

CHECKED: KRS

U.S. Commissioner's Residence

Rigidities are from Table T-1 of Reinforced Masonry Engineering Handbook - Amrhein

U. S. Commissioners House, Mammoth
sept 6 2009

**SHEAR WALLS - LOAD DISTRIBUTION
SECOND FLOOR - N-S EARTHQUAKE**

SHEAR THIS FLOOR =

.....(x) 1.5
(code)= 131958
TORSIONAL MOMENT = 197937
OVERTURNING MOMENT = 131958 (x) 0.85 (=) 112164
CENTER OF RIGIDITY X_{cm} = 21.53 dist to 'Y' axis
Y_{cm} = 16.09 dist to 'X' axis

THIS PROJECT:
Y-DIR IS E-W
X-DIR IS N-S

Note: Have to enter numerical values in columns noted with

Torsional Shear is calculated parallel to the direction of the earthquake, i.e. torsional calculation uses distance between the principal center of rigidity (in direction of walls) and the centroid of the respective walls - times the torsional moment
Note: Torsional Moment is calculated in direction of earthquake

FORMULAS: F_v = Vmod (x) R/sum R

Y-WALL: F_{lor} = R_x(d-x)/(sum R_x(d-x)) x (MI)

X-WALL: F_{lor} = R_y(d-y)/(sum R_y(d-y)) x (MI)

WALL	DIR	LGTH	HT.	TH	t'	H/L RIGIDITY		% R	TO Y		TO X		L times dist to Y	L times dist to X	R times dist to Y	R times dist to X	R times dist to Y	R times dist to X	Dx-Y _{cm}	Dy-X _{cm}	to X	to Y	dny is dist		R(dnx)(dny)	R(dnx)(dny)	F _v	F _{lor}	F _t	OTM	STR	PSI						
						R _x	R _y		dist to Y	dist to X	to X	to Y											R * (dny)	R * (dny)														
						Per 1'	Full Thick																															
X2-1	X	9.57	5.69	19	0.5946	5.062	96.178	0.139	4.99	30.54	47.75	292.27	2937.28	14.45	1389.77	20082.20685	27529	441	27970	870506	12.8																	
X2-2	X	15.23	5.69	19	0.3736	8.616	163.704	0.237	21.23	30.54	323.33	465.12	4999.52	14.45	2365.52	34181.80446	46856	751	47607	1481853	13.7																	
X2-3	X	9.63	5.69	19	0.5909	5.062	96.178	0.139	37.50	30.54	361.13	294.10	2937.28	14.45	1389.77	20082.20685	27529	441	27970	870606	12.7																	
X2-4	X	9.52	5.69	18	0.5977	4.960	89.280	0.129	4.94	0.75	47.03	7.14	66.96	-15.34	-1369.56	21008.97677	25554	-435	25119	808165	12.2																	
X2-5	X	15.23	5.69	18	0.3736	8.616	155.088	0.224	21.22	0.75	323.18	11.42	116.32	-15.34	-2379.05	36494.82577	44390	-756	43634	1403861	13.3																	
X2-6	X	9.61	5.69	18	0.5921	5.062	91.116	0.132	37.56	0.75	360.95	7.21	88.34	-15.34	-1397.72	21441.01621	26080	-444	25636	824785	12.4																	
													11125.69																									
													153290.8369																									

**SHEAR WALLS - LOAD DISTRIBUTION
SECOND FLOOR : N-S EARTHQUAKE**

WALL	DIR	LGTH	HT	TH	H/L RIGIDITY		Ry		Per 1" th		Ry		Full Thick		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry		Ry	
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CHECKED: KRS

Rigidities are from Table T-1 of Reinforced Masonry Engineering Handbook - Amrhein

U. S. Commissioners House; Mammoth

aug 27-09

SHEAR WALLS - LOAD DISTRIBUTION

LOWER LEVEL : E-W EARTHQUAKE

SHEAR THIS FLOOR =

1.5

TORSIONAL MOMENT =

OVERTURNING MOMENT Mol = 7217046

CENTER OF RIGIDITY:

Effective Wall Ht this floor = 8.0'

WALL DIR LGTH HT. THICK

L' t' i'

H/L RIGIDITY RIGIDITY

Per 1" th Full Thick

R' R" R'

% R

TO Y

TO X

Dx

dist to Y dist to X

L x Dy L x Dx

R x Dy R x Dx

(R x Y) (R x X)

dist to Y axis

dist to X axis

Ycm=

Xcm=

20.58

15.24

dist to Y axis

dist to X axis

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dist to X axis

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dist to Y axis

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THIS PROJECT:

Y-DIR IS E-W

X-DIR IS N-S

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IBC(06) 2106.5.1

316944 (x)

10.08 (=)

3194796

Note: have to enter numerical values in columns noted with

Torsional Shear is calculated parallel to the direction of the earthquake; i.e. torsional calculation

uses distance between the principal center of rigidity (in direction of walls)

and the centroid of the respective walls - times the torsional moment

Note: Torsional Moment is calculated in direction of earthquake

FORMULAS: Fv = Vmod (x) R/sum R

Y-WALL Flor = R*(dny)/(sum R(dny(dnx))) x (Mi)

X-WALL Flor = R*(dny)/(sum R(dny(dny))) x (Mi)

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L' t' i'

H/L RIGIDITY RIGIDITY

Per 1" th Full Thick

R' R" R'

% R

TO Y

TO X

Dx

dist to Y dist to X

L x Dy L x Dx

R x Dy R x Dx

(R x Y) (R x X)

dist to Y axis

dist to X axis

Ycm=

Xcm=

20.58

15.24

dist to Y axis

dist to X axis

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APPENDIX C

ADA – BACKGROUND

(Excerpted from UFAS Unit 2 - Regulatory issues)

The four federal standard setting agencies, the General Services Administration, the Department of Defense, the Postal Service, and the Department of Housing and Urban Development developed the Uniform Federal Accessibility Standards (UFAS) to be consistent with the Minimum Guidelines and Requirements for Accessible Design (MGRAD). As such, when introduced in 1984, UFAS was the most comprehensive standard to date and is still the referenced standard for all buildings designed, constructed, altered, or leased with federal funds.

Cities, counties, or states develop their own building construction regulations, and most have added accessibility provisions by adopting in whole or in part the current technical specifications of ANSI 117.1, UFAS, MGRAD, or those in one of the model codes. All states have some form of access standards.

If no federal money is used in the design, construction, or renovation of the facility, then the Architectural Barriers Act (1968) does not apply. However, if no federal money is used in the renovation of the facility then the provisions of the local / state building code must be complied with. In recent times most states have adopted the latest edition of the International Building Code. The 2006 edition of IBC contains provisions for accessibility that are referenced from CABO/ANSI 117.1. In summary, the ADA requirements are very similar regardless of the source of funding.

HISTORIC STRUCTURES

In regard to historic structures, UFAS provides the following guidance in UNIT 2 - Regulatory Issues:

The general approach to application of [A.D.A.] standards is to require a cooperative analysis of each renovation/alteration to a "qualified structure" (i.e. a property already listed or declared eligible for listing on the National Register of Historic Places) by interested parties, state and local advisory councils on historic preservation, and others to determine the extent and methods for compliance. The procedures for completing this analysis are described in Section 106 of the National Historic Preservation Act of 1966, as amended.....

The agency can use alternate means to create program access

Nevertheless (considering the procedure described above) those historic buildings covered by the Architectural Barriers Act must adhere to the provisions of UFAS when renovations are undertaken.

Under MINIMUM REQUIREMENTS FOR PROJECT TYPE the UFAS standard continues:

*In the special case of historic buildings the requirements for providing access are detailed in Subsection 4.1.7 of UFAS, pages 13-14.** The general approach to application of standards at historic sites is to require a cooperative analysis of each renovation/alteration to a "qualified structure" to determine the extent and methods for compliance. The procedures for completing this analysis are described in Section 106 of the National Historic Preservation Act of 1966, as amended, 16*

United States Code 470 (including Executive Order 11593, Protection and Enhancement of the Cultural Environment); and "Protection of Historic and Cultural Properties", 36 CFR Part 800.

Each federal agency is responsible for taking into account the effect of an undertaking on any property included (or eligible for inclusion) in the National Register of Historic Places. As a general rule, an official from the federal agency will work with the State Historic Preservation Officer and other interested parties to identify potential conflicts and propose methods for resolving the conflicts during the early planning stages of the project. The goal of this initial planning is to determine what effects (either None, Not Adverse, or Adverse), the proposed undertaking will have on the property.

If it is determined that there will be some effect on the property, the Advisory Council on Historic Preservation reviews and comments on the proposed plans and either amends or accepts the plan. If it is determined that some adverse effect will occur, it is necessary to draw up a Memorandum of Agreement outlining how the effects will be taken into account. An understanding is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Only after the Council has determined that accessibility requirements for accessible routes, ramps, entrances, toilets, parking, displays, and signage have an adverse effect can the special application provisions of Subsection 4.1.7(2), page 14, be utilized. And even

then, all requirements which do not have an adverse effect must be met.

*(** applicable portions of Pages 13 & 14 of Subsection 4.1.7 have been attached below for reference.)*

Note that the preceding paragraphs apply only to federally funded projects; projects funded through State, local, or Private sources must comply with CABO/ANSI 117.1.

The Federal Standards (as well as CABO/ANSI 117.1) both have provisions for implementing 'Alternative Measures' to compliance requirements.

Alternative measures: The wording in ANSI regarding alternative measures is identical to the federal standard (UFAS); the only difference being that a state or local preservation officer can apply the criteria and the involvement of the presidents Advisory Council is not required. A condensation of the Alternative Measures is listed below:

Accessible routes: *Can be limited to (1) for historic properties if multiple routes create adverse impacts.*

Accessible Entrance: *Only (1) accessible entrance is required to be provided and it does not have to be the primary public entrance.*

Accessible toilets: *Only (1) accessible toilet is required within a facility if adverse effects are caused by providing multiple toilets; it can also be of uni-sex design.*

All publicly used spaces on the accessible floor of the facility must be accessible; not all floors within the facility have to be accessible if vertical access causes adverse effects although it is strongly encouraged.

APPENDIX D

PERSONNEL

This report has been prepared as part of Cooperative Agreement H1233E007 between the Montana Preservation Alliance and its related contractors; and the National Park Service, Yellowstone National Park.

The purpose of the agreement referenced above is to create Historic Structures Reports for selected historic properties as a first phase to address treatment of Historic Structures in Yellowstone National Park. The U.S. Commissioner's Residence and Jail has been identified as one of those historic properties.

The primary partners in the co-operative agreement are:

- National Park Service – Yellowstone National Park
- Montana Preservation Alliance
- Sievert & Sievert CRC – Professional consultants in the fields of Historic Architecture, Architecture, and Structural Design.

Participants in the preparation of this report, including their areas of expertise, were:

- Chere Jiusto – MPA; Director & Historian – history, chronology, and historic significance of the Commissioner's House.

- Kenneth R. Sievert A.I.A.; A.S.C.E. (aff). – technical author; principal investigator of materials, structural assemblies, materials conservation, and building codes; project manager for S&S.

- Herbert E. Dawson – YNP Historic Architect; – contributions throughout.

- Lee H. Whittlesey M.A., J.D., Ph.D. (hon) – YNP Historian – history and chronology of the U.S. Commissioners Residence

- Tobin Roop – Chief; Branch of Cultural Resources; Yellowstone National Park. Project Manager.

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STATE OF NEW YORK

IN SENATE

January 10, 1907

REPORT

OF

THE COMMISSIONER

OF THE LAND OFFICE

IN RESPONSE TO A RESOLUTION

ADOPTED

BY THE SENATE

APRIL

1906

ALBANY

1907

BY

THE COMMISSIONER

OF

THE LAND OFFICE

AND

BY THE SENATE

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BY THE ASSEMBLY

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APPENDIX F STRUCTURAL ANALYSIS

SIMPLE BEAM ANALYSIS - UNIFORM LOAD

PROJECT	U.S. Commissioner's House		
DATE	11/16/10		
BEAM DESCRIPTION	Typ roof rafter		
COMMENTS / NOTES:	Collar tie disregarded		
SPAN (IN FEET)	14.12		
TRIBUTARY WIDTH (FT.)	2.00		
DEAD LOAD (PSF)	10.00		
LIVE LOAD (PSF)	68.90		
DEAD LOAD ON BEAM (PLF)	20.00		
LIVE LOAD ON BEAM (PLF)	137.80		
DURATION OF LOAD FACTOR (1.15, 1.25, 1.33-EX)	1.15		
MAXIMUM LIVE LOAD W/ D.O.L. FACTOR	119.83		
TOTAL LOAD ON BEAM (PLF)	157.80		
MATERIAL	DF / LARCH		
GRADE	#2		
Allowable Bending Stress (PSI)-BASIC	1200.00 Fb		
Bending Stress Fb (x) Cr (x) Cm (x) Csu (x) Cf	1587.00	Cr	1.15
		Cm	1.00
		Csu	1.15
Allowable Shear Stress (PSI)-BASIC	180.00 Fc		
Allowable Shear Fv (x) Cm	180.00	Cm	1.00
Modulus of Elasticity (PSI)-BASIC	1400000.00 E		
Modulus of Elasticity E (x) Cm	1400000.00	Cm	1.00
ANALYSIS RESULTS			
Maximum Moment (FT-LB)	3932.66		
DL Moment (FT-LB)	498.44		
LL Moment (FT-LB)	3434.22		
Maximum Shear Force (LB)	1114.07		
VDL (LB)	141.20		
VLL (LB)	972.87		
Enter Shear Selected	1125.00		
Enter Shear Factor (1.5 for Wood)	1.50		
Shear to be used for Calculation	1687.50		
DEFLECTION CRITERIA			
Ex. 1/360 - enter 360	360.00		
Deflection based on criteria (IN)	0.47		
Enter Deflection selected (IN)	0.75		
BEAM SELECTION			
Required Area (IN-2)	9.38		
Required Section Modulus (IN-3)	29.74		
Required Moment Of Inertia (IN-4)			
Formual Numerator			54195038384

Formula Denominator

403200000

Reqd I =

134.41

OPTIONS:

2x6 RS

Width (in)

Depth (in)

2

6

A=

12.00

S=

12.00

I=

36.00

SHEAR AT DISTANCE 'd' FROM SUPPORT

Depth of member (in FT)

0.50 FT

Shear reduction (at distance 'd' from support)

78.90 LB

Total Shear at distance 'd' from support

1046.10 w/o Shear Factor

Total Shear w/ Shear Factor

1569.15 LB

Area required at distance 'd' from support

8.72 IN-2

**** rafters are not adequate without collar ties or supplemental bracing**

SIMPLE BEAM ANALYSIS - UNIFORM LOAD

PROJECT	U.S. Commissioner's House		
DATE	11/16/10		
BEAM DESCRIPTION	Typ roof rafter		
COMMENTS / NOTES:	Includes collar tie, horizontal projection		
SPAN (IN FEET)	9.79		
TRIBUTARY WIDTH (FT.)	2.00		
DEAD LOAD (PSF)	10.00		
LIVE LOAD (PSF)	68.90		
DEAD LOAD ON BEAM (PLF)	20.00		
LIVE LOAD ON BEAM (PLF)	137.80		
DURATION OF LOAD FACTOR (1.15,1.25,1.33-EX)	1.15		
MAXIMUM LIVE LOAD W/ D.O.L. FACTOR	119.83		
TOTAL LOAD ON BEAM (PLF)	157.80		
MATERIAL	DF / LARCH		
GRADE	#2		
Allowable Bending Stress (PSI)-BASIC	1200.00 Fb		
Bending Stress Fb (x) Cr (x) Cm (x) Csu (x) Cf	1348.95	Cr	1.15
		Cm	0.85
		Csu	1.15
Allowable Shear Stress (PSI)-BASIC	180.00 Fc		
Allowable Shear Fv (x) Cm	174.60	Cm	0.97
Modulus of Elasticity (PSI)-BASIC	1400000.00 E		
Modulus of Elasticity E (x) Cm	1260000.00	Cm	0.90
ANALYSIS RESULTS			
Maximum Moment (FT-LB)	1890.52		
DL Moment (FT-LB)	239.61		
LL Moment (FT-LB)	1650.91		
Maximum Shear Force (LB)	772.43		
VDL (LB)	97.90		
VLL (LB)	674.53		
Enter Shear Selected	1125.00		
Enter Shear Factor (1.5 for Wood)	1.50		
Shear to be used for Calculation	1687.50		
DEFLECTION CRITERIA			
Ex. 1/360 - enter 360	360.00		
Deflection based on criteria (IN)	0.33		
Enter Deflection selected (IN)	0.75		
BEAM SELECTION			
Required Area (IN-2)	9.66		
Required Section Modulus (IN-3)	16.82		
Required Moment Of Inertia (IN-4)			
Formual Numerator			12524243669

Formula Denominator

362880000

Reqd I =

34.51

OPTIONS:

2x6 RS

Width (in)

Depth (in)

2

6

A=

12.00

O.K.

S=

12.00

**

I=

36.00

O.K..

SHEAR AT DISTANCE 'd' FROM SUPPORT

Depth of member (in FT)

0.50 FT

Shear reduction (at distance 'd' from support)

78.90 LB

Total Shear at distance 'd' from support

1046.10 w/o Shear Factor

Total Shear w/ Shear Factor

1569.15 LB

Area required at distance 'd' from support

8.99 IN-2

O.K..

****40% undersized in bending for full snow load**

O.K. for 46 psf snow load (approx. 3' snow depth)

SIMPLE BEAM ANALYSIS - UNIFORM LOAD

PROJECT

U.S. Commissioner's House

DATE

11/16/10

BEAM DESCRIPTION

Typ 2nd floor joists

COMMENTS / NOTES:

SPAN (IN FEET)	13.28
TRIBUTARY WIDTH (FT.)	2.00
DEAD LOAD (PSF)	15.00
LIVE LOAD (PSF)	40.00
DEAD LOAD ON BEAM (PLF)	30.00
LIVE LOAD ON BEAM (PLF)	80.00
DURATION OF LOAD FACTOR (1.15, 1.25, 1.33-EX)	1.00
MAXIMUM LIVE LOAD W/ D.O.L. FACTOR	80.00
TOTAL LOAD ON BEAM (PLF)	110.00

MATERIAL

DF / LARCH

GRADE

#2

Allowable Bending Stress (PSI)-BASIC	1200.00 Fb		
Bending Stress Fb (x) Cr (x) Cm (x) Csu (x) Cf	1348.95	Cr	1.15
		Cm	0.85
		Csu	1.15
Allowable Shear Stress (PSI)-BASIC	180.00 Fc		
Allowable Shear Fv (x) Cm	174.60	Cm	0.97
Modulus of Elasticity (PSI)-BASIC	1400000.00 E		
Modulus of Elasticity E (x) Cm	1260000.00	Cm	0.90

ANALYSIS RESULTS

Maximum Moment (FT-LB)	2424.93
DL Moment (FT-LB)	661.34
LL Moment (FT-LB)	1763.58
Maximum Shear Force (LB)	730.40
VDL (LB)	199.20
VLL (LB)	531.20
Enter Shear Selected	1125.00
Enter Shear Factor (1.5 for Wood)	1.50
Shear to be used for Calculation	1687.50

DEFLECTION CRITERIA

Ex. 1/360 - enter 360	360.00
Deflection based on criteria (IN)	0.44
Enter Deflection selected (IN)	0.75

BEAM SELECTION

Required Area (IN-2)	9.66
Required Section Modulus (IN-3)	21.57
Required Moment Of Inertia (IN-4)	
Formual Numerator	29559611902

Formula Denominator		362880000
Reqd I =	81.46	
OPTIONS:		
	2x8 RS	Width (in)
A=		2
S=	16.00	Depth (in)
I=	21.33	8
	85.33	O.K.
		**
		O.K..
SHEAR AT DISTANCE 'd' FROM SUPPORT		
Depth of member (in FT)	0.50 FT	
Shear reduction (at distance 'd' from support)	55.00 LB	
Total Shear at distance 'd' from support	1070.00 w/o Shear Factor	
Total Shear w/ Shear Factor	1605.00 LB	
Area required at distance 'd' from support	9.19 IN-2	O.K..

Simplified Procedure - Main Wind Force Resisting System				
Design Wind Pressure Components (ASCE 7-02)				
Building Height	=	35		
Roof Angle	=	45		
Basic Wind Speed	=	90		(Figure 6-1)
Category	=	II		(Table 1-1)
Importance Factor (I)				(Table 1-1)
Exposure Category				
Enclosure Category	=	Enclosed Buildings	(Constant value)	
Design Wind Pressure, p, Figure 6-2 - Load Case 1				
Design wind pressures and forces are determined by figure 6-2				
Location	Ps30 (psf)	I	Adjustment Factor	Ending P (psf)
Zone A	14.4	1	1.05	15.12
Zone B	9.9	1	1.05	10.395
Zone C	11.5	1	1.05	12.075
Zone D	7.9	1	1.05	10
Zone E	1.1	1	1.05	10
Zone F	-8.8	1	1.05	-10
Zone G	0.4	1	1.05	10
Zone H	-7.5	1	1.05	-10
Eoh	-5.1	1	1.05	-10
Goh	-5.8	1	1.05	-10
Design Wind Pressure, p, Figure 6-2 - Load Case 2				
Design wind pressures and forces are determined by the formula				
Location	Ps30 (psf)	I	Adjustment Factor	Ending P (psf)
Zone A	14.4	1	1.05	15.12
Zone B	9.9	1	1.05	10.395
Zone C	11.5	1	1.05	12.075
Zone D	7.9	1	1.05	10
Zone E	5.6	1	1.05	10
Zone F	-4.3	1	1.05	-10
Zone G	4.8	1	1.05	10
Zone H	-3.1	1	1.05	-10
Eoh	-5.1	1	1.05	-10
Goh	-5.8	1	1.05	-10

MODIFICATION FACTORS

		Fb	Ft	Fv	Fc-per	Fc-pll	E
Repetitive Member Factor	Cr	1.15	1.00	1.00	1.00	1.00	1.00
Wet Service Factor	Cm	0.85	1.00	0.97	0.67	0.80	0.90
Flat Use Factor	Csu						
	2"	1.00	1.00	1.00	1.00	1.00	1.00
	3"	1.00	1.00	1.00	1.00	1.00	1.00
	4"	1.10	1.00	1.00	1.00	1.00	1.00
	5"	1.10	1.00	1.00	1.00	1.00	1.00
	6"	1.15	1.00	1.00	1.00	1.00	1.00
	8"	1.15	1.00	1.00	1.00	1.00	1.00
	10" & 10"+	1.20	1.00	1.00	1.00	1.00	1.00
Size Factor	Cf						
Sel Str. #1-#3	2x4	1.50	1.50	1.00	1.15	1.00	1.00
	2x6	1.30	1.30	1.00	1.10	1.00	1.00
	2x8	1.20	1.20	1.00	1.05	1.00	1.00
	2x10	1.10	1.10	1.00	1.00	1.00	1.00
	2x12	1.00	1.00	1.00	1.00	1.00	1.00

**** See NDS for member sizes not shown above**

APPENDIX G: Miscellaneous Historic Plans

