



THE CONCRETE COALITION
Community Risk Profile Summary

Community Risk Profile Summary for Berkeley

Please note: Estimates in this report are preliminary and have not yet been reviewed for accuracy.

Population: 100,744

Year of Incorporation: 1878

Population Density: 9,594.7

Data Sources	Counts & Surveys	Discussion with Building official
	Plans and Histories	Sanborn Maps
	Field Work	Selected sample areas
	Google Earth	

Total Number of Buildings:

Single Family Residences:

Multi-Family Residences:

Other Private Buildings:

City Buildings:

Total number of concrete buildings:

Total number of pre-1980 buildings:

Total Square Footage:

Total Number of Pre-1980 Concrete Buildings: 275

Total Square Footage of Pre-1980 Concrete Buildings:

Total Square Footage of Pre-1980 Concrete Buildings:

(* Concrete Coalition will provide counts for public schools, OSHPD-regulated hospitals and State of CA buildings)

Attached Files (see below):

- 1) City-of-Berkeley_CC_estimate.pdf (Pages 3 - 5)
- 2) Berkeley_Sanborn_Map_Review.xls (Pages 6 - 15)
- 3) Methodology.doc (Page 16)

Reporter's Information

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Title: Building Official

Organization: City of Berkeley

Comments: See attached WORD file that explains our methodology. Also see attached pdf that explains our first approach.

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The City of Berkeley


Estimating Pre-1980 Concrete Buildings

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 Joan MacQuarrie
 City of Berkeley, Building Official
 Building and Safety Division

January 28, 2009

Berkeley Statistics

	Population	100,000 people
	City Area	10 sq mi
	Year of incorporation	1878
	Population Density	10,000 people/sq mi
	Known Faults within City Limits	Hayward Fault

- ♦ Interesting facts:
 - UC Berkeley Campus 
 - Active Building Dept
 - Highly educated population

Useful Step: History of City

Source: "Berkeley, A City in History" by Charles Wollenberg © 2002

- ♦ Building and Population Boom years:
 - Post 1906
 - ♦ Population quadrupled within a decade
 - Post 1923 Great Fire
 - ♦ Housing, commercial, manufacturing construction booms
 - Post WWII
 - ♦ apartment construction for huge influx of UCB students
- ♦ Historical Earthquake Damage:
 - 1868 – not much of a city to be damaged
 - 1906 – minor damage
 - 1989 – minor damage

Useful Step: Get GOOD Contacts

- ♦ City of Berkeley—Building & Safety Division
 - Current and retired building officials
 - Seismic Safety Coordinator
 - Plan Checkers
 - Building Inspectors
- ♦ Alameda County—Assessment Services Div.
- ♦ Engineers / Architects
- ♦ Professors (Architecture & Engineering)
- ♦ City Safety Advocates (leaders of programs)
- ♦ Realtors & Developers

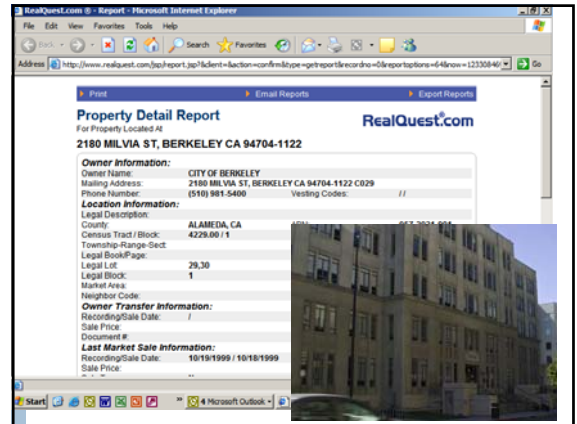
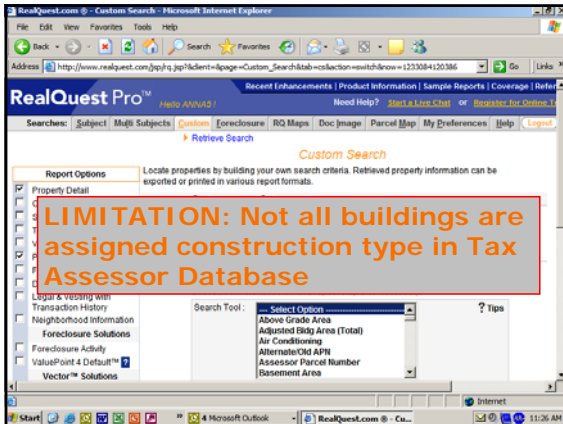
Make Contacts at the BUILDING DEPT!!!

Useful Step: Mitigation Programs

- ♦ City of Berkeley Building Seismic Mitigation Programs:
 - Public School & Fire Station & City Hall Retrofit Program
 - ♦ COMPLETED!
 - URM Inventory and Mandatory Retrofit Ordinance
 - ♦ ~ 90% Complete
 - Tilt-up Inventory
 - Soft Story Engineer's Analysis Required (but NO Mandatory Retrofit Ordinance...yet)
- ♦ UC Berkeley Seismic Mitigation Program

PROCESS: Data Mining

- ♦ REALQUEST
 - Software extracts data from Tax Assessor's Data
 - Many city planning departments subscribe to this service!
- ♦ Berkeley Approach:
 - RealQuest search with filters:
 - ♦ for Building Type = "Concrete" & "Masonry"
 - ♦ For Year Building from 1860 – 1979
 - ♦ For City of Berkeley
 - Yields list of addresses meeting the filter criteria
 - Subtract known tilt-up and URM buildings



PROCESS: Street Survey

- Survey commercial corridors where concrete buildings are likely

Method Used:
CAR Driving Survey

- GOALS:**
 - Look for missing concrete buildings
 - Identify buildings on current list that should be removed

PROCESS: Getting the Number

805 Take REALQUEST Number

- 78 = 727 Remove Condo Duplicates

Remove Existing Bldg Inventories:

- 242 = 476** URM List
- 33 = 452** Conc Tilt-up list

x 0.4 = 180 Adjust for Accuracy based on Street Survey:
only 40% of surveyed bldgs from list are actually concrete

PROCESS: Final Number

- Final personal check:
 - Only small percentage of city buildings are concrete as seen during driving survey
 - We've seen at least 5 times as many URM
 - Based on known quantity of URM: Concrete is about 20% of URM $0.2 \times 730 = 150$
 - Familiarity with the city (live and work in Berkeley)

FINAL ESTIMATE = 150 – 250 Buildings

PROCESS: Further Refinement

- Additional street surveys of commercial & industrial & student residential corridors
- Contact local experts and get their "endorsement" of the process and final number
 - Engineers
 - Architects
 - Realtors & Developers
 - Building Inspectors

Final Thoughts

- ♦ Don't get frustrated with inaccuracy
- ♦ Sidewalk surveys give good reality check
- ♦ Good contacts –work with your local government
- ♦ Knowing the history of the city is useful
- ♦ Expert panel should provide worthwhile feedback

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City of Berkeley, Building Official
Building and Safety Division

Basic Count for City of Berkeley from Sanborn Maps

created from map hard copies stored in the City of Berkeley Planning Department
 maps created in 1911 with revisions every year from 1960-69 then Dec 1980 and April 1981 (unless noted otherwise)
 reviewed by: Joan MacQuarrie, Building Official City of Berkeley & Heidi Faison, PEER Outreach
 Director with help from Emmett Seymour, PEER Intern Cal Poly SLO on Volume 4
 dates of map review: 5/4/09, 6/2/09, 7/13/09, 7/16/09
 total hours of map review: 20 hours

Notes on Types of Buildings Included:

- included: blue rectangle with "CONCRETE"
- included: all dirty tan/brown buildings that are designated as fire resistive buildings if they were made of concrete according to the handwritten text notes
- included: concrete building with wood roof and posts & concrete walls with steel roof trusses
- included: public schools if concrete even though City of Berkeley has retrofitted just in case bulding has been reused
- not included: blue rectangle with (C.B.) = hollow concrete or cement block construction
- not included: plain blue building = stone building
- not included: UC Berkeley Campus Buildings
- not included: Bart stations
- not included: dwelling garages and dwelling accessories shown as concrete (unless are a commercial building)

Possible improvements to this count:

- determining how many concrete frames (A-1-a descriptions or by text), often are brown buildings on maps (approximately 10% ???)
- field verification of sheets -- ideally 10 samples per volume -- to better account for retrofits, demos and vacant buildings (could reduce by approxiately 10%)
- determining how many are wood roof truss with wood posts or steel truss with wood posts (approximately 25% of total count)

TOTAL SUM OF 4 VOLS = 314

(includes estimated reduction for retrofits, vacancies, demolished buildings)

FINAL ESTIMATE based on this count = 275

Vol1 (page 48-end=93)

page:	count:	
1	5	
2	0	
3	3	
4	2	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	
11	1	
12	3	
13	1	
14	1	
15	0	
16	1	residential
17	0	

18	0
19	2
20	1
21	0
22	0
23	0
24	2 concrete dwellings
25	1 kaiser medical Care hospital supplies and drug headquarters
26	3
27	2
28	1
29	4 Franklin Public School
30	0
31	0
32	0
33	0
34	1
35	0
36	0
37	0
38	0
39	1
	Two RC Frames (Pacfic Shool of Religion & Church Jesus Christ of
40	2 Latter Day Saints)
41	4 Two RC Frames for Church of Divinity School of the Pacific
42	0
43	1
44	2 (one other shown but has been demolished)
45	3 Two RC Frames
46	1
47	6
48	2 One RC Frame at Berkeley High West Campus
49	0
50	1
51	2
52	0
53	1
54	2 One RC Frame for Alameda County Judicial District Court House
55	1
56	6
57	3 includes 2209 7th st = Columbus Public School
58	2
59	1
60	0
61	0
62	0
63	0
64	0
65	0
66	1 Berkeley Unified School District Offices, (old hall of justice demolished)
67	2
68	4
69	6 some may have been demolished or retrofitted (~
70	10

	includes berkeley high campus and berkeley civic center (now base
71	3 isolated) - needs further review
72	missing
73	missing
74	6
75	2
76	5
77	3
78	3
79	0
80	0
81	6
82	0
83	1
84	7
85	6
86	1
87	0
88	2
89	0
90	0
91	0
92	0
93	0
	143

Vol2 (page 126-end)
page:

	count:
126	0
127	0
128	0
129	1 washington school at the corner of Bancroft and McKinnley
130	12 includes berkeley high gyms & Herrick Memorial hospital
131	2 on bayer campus - may have been removed
132	3 on bayer campus - may have been removed
133	2
134	0
135	0
136	0
137	0
138	0
139	1
140	3
141	4
142	0
143	0
144	1
145	0
146	1
147	4 3 included in bayer campus - may have been removed
148	4
149	7
150	0
151	0

152	0
153	0
154	0
155	0
156	3
157	2
158	0
159	0
160	3 includes willard junior high gym
161	0
162	0
163	0
164	0
165	1
166	4
167	3
168	3
169	0
170	0
171	0
172	0
173	0
174	3
175	1
176	1 LeConte Public School corner of Russel and Elsworth
177	1
178	1
179	0
180	3
181	1
182	2
183	3
184	6
185	2
186	0
187	0
188	2 concrete dwellings!
189	0
190	2
191	1
192	0
193	0
194	0
195	1
196	2 one bldg is Alta btes Hosp
197	1
198	1
199	2
200	0
201	1 laundry at Claremont Hotel
202	1 house
203	2 emeryville
204	2 e'ville
205	2 e'ville

206	1 e'ville
207	2 e'ville
208	2 oakland
209	0 oakland
210	0
211	0
212	0
213	2
214	0
215	0 oakland
216	0 oakland
217	0 oakland
218	1 catholic school oakland St augustus dana and alcatraz
219	0 oakland
220	0
221	1 house!
222	0
223	2 oakland
224	0 Oakland
225	0 oakland
226	0
227	1
228	0 oakland
229	1 half in Oakland; half in Berkeley
230	0
231	0
232	0
233	1 EBMUD pumping plant
234	0
235	0
236	0
237	0

108 *(with non-berkeley cities removed)*

Vol3 (page 301-end=383)

page:	count:
301	0
302	0
303	0
304	0
305	0
306	0
307 Missing	
308 Missing	
309	9
310	0
311	0
312	0
313	0
314	3
315	2
316	5
317	0

318	3
319	0
320	1
321	0
322	0
323	1
324	2
325	3
326	0
327	2
328	2 US Dept of Agriculture Buildings on Buchanan (partly retrofitted)
329	0
330	0
331	0
332	1
333	0
334	0
335	0
336	0
337	1
338	0
339	0
340	0
341	0
342	0
343	0
344	2
345	0
346	3 Jefferson Grammer School
347	0
348	0
349	1 MLK Junior High
350	2 MLK Junior High
351	0
352	0
353	0
354	0
355	2 includes North Berkeley Branch Public Library
356	0
357	0
358	0
359	0
360	2 includes School of the Madeline
361	0
362	0
363	0
364	0
365	0
366	0
367	1
368	0
369	0
370	1
371	0

372	0
373	0
374	0
375	0
376	0
377	0
378	0
379	1
380	0
381	0
382	0 did not include shasta reservoir
383	0 did not include woods reservoir

50

Vol4 (page 401-end=479)

page:	count:		
401	1	el cerrito / Richmond	not revised since 1967
402	2	el cerrito / Richmond	not revised since 1967
403	0	albany	not revised since 1967
404	Missing		not revised since 1967
405	Missing		not revised since 1967
406	0	albany	not revised since 1967
407	0	albany	not revised since 1967
408	1	albany	not revised since 1967
409	1	El Cerrito	not revised since 1967
410	1	El Cerrito	not revised since 1967
411	1	Albany	not revised since 1967
412	0	albany	not revised since 1967
413	0	El Cerrito / Albany	not revised since 1967
414	2	El Cerrito, Capwells' De	not revised since 1967
415	3	Albany, 2 concrete dwel	not revised since 1967
416	0	Albany	not revised since 1967
417	1	Albany	not revised since 1967
418	0	Albany	not revised since 1967
419	1	Albany	not revised since 1967
420	0	Albany	
421	0	El Cerrito	
422	0	El Cerrito	not revised since 1967
423	0	El Cerrito	not revised since 1967
424	0		not revised since 1967
425	0	Albany / El Cerrito	not revised since 1967
426	0	Albany	not revised since 1967
427	0	Albany	not revised since 1967
428	2	Albany, Albany High Sc	not revised since 1967
429	0	Albany / El Cerrito	not revised since 1967
430	0	El Cerrito	not revised since 1967
431	2	Albany/ berkeley, Concr	not revised since 1967
432	0	Albany / Berkeley	not revised since 1967
433	2		
434	0		
435	2	Oaks movie theater (concrete with steel fram)	
436	0		
437	0		
438	0		

439	0
440	0
441	0
442	0
443	0
444	0
445	0
446	0
447	0
448	0
449	1 El Cerrito pumping plant
450	0
451	0
452	0
453	3 One Concrete Dwelling,
454	0
455	0
456	0
457	0
458	0
459	0
460	0
461	0
462	0
463	0
464	0
465	0
466	0
467	2 store and dwelling
468	0
469	0
470	1
471	1 EBMUD San Pablo Filters
472	0
473	1 concrete dwelling
474	0
475	0
476	0
477	0
478	0
479	0 not revised since 1967

13 *(with non-berkeley cities removed)*

TOTAL SUM OF 4 VOLS =

314

City of Berkeley Sanborn Map review

*maps created in 1911 with revisions every year from 1960-69 then Dec 1980 and April 1981

* volume 1 page 2, 3 missing

* note some garages and dwelling accessories shown as concrete but not including unless are a commercial building

Sanborn Map Volume	Page #	Address Number	Address Street	Needs Site Demo?	Review	School with Retrofit	within scope?	Notes	Date of Review
1	1	740	Jones				x	wood posts and beams	5/4/2009
1	1	1604	4th St					conc first floor with wood second floor trusses	5/4/2009
1	1	770	Cedar St						5/4/2009
1	4	1521	San Pablo Ave						5/4/2009
1	11	1900	Rose					aka 1401-1405 MLK andronico's on north	5/4/2009
1	12	1444	Shattuck Ave				x	shattuck	5/4/2009
1	12	1451	Shattuck Ave	x					5/4/2009
1	13	1521	Spruce					2nd Church of Christ Scientist office building with cmu and concrete, berkeley	5/4/2009
1	19	1553	King				x	board of realtors?	5/4/2009
1	19	1645	Milvia			X		aka 2022 Lincoln	5/4/2009
1	20	1650	Shattuck Ave					aka 2740 Lincoln, north end of building concrete with remainder brick	5/4/2009
1	24	1616	La Vereda				x		5/4/2009
1	24	1725	Hilgard				x		5/4/2009
1	25	600-630	Virginia				x	wood posts and beams	5/4/2009
1	26	1701	4th St				x	aka 1722-1742 Virginia	5/4/2009
1	26	701-713	Hearst				x		5/4/2009
1	26	1710	Delaware					concrete and birck	5/4/2009
1	27	1700	6th St					aka 1800 virginia	5/4/2009
1	27	827	5th						5/4/2009
1	27	801	Delaware						5/4/2009
1	28	1041	Hearst						5/4/2009
1	29	1150	Virginia				?	franklin school--changed to adult school therefore not necessarily retrofit electric utility substation F PG&E, aka 1644	5/4/2009
1	34	1900	McGee				x	Hearst Pacific School of Religion	5/4/2009
1	40	1798	Scenic					church, aka 2381 La Conte	5/4/2009
1	40	2369	La Conte						5/4/2009
1	41	1831	Euclid						5/4/2009
1	41	1841	Euclid						5/4/2009

1	43	620 Hearst		corner of east shore highway, Truit and White Lumber	5/4/2009
1	44	636 University Ave	x		
1	44	740-750 Hearst	x	post office, wood truss room, cb façade	5/4/2009
1	44	650 University Ave		concrete block and concrete and glass block	5/4/2009
1	46	1007 University Ave 1960-			5/4/2009
1	46	1962- San Pablo Ave			5/4/2009
1	47	111 University Ave 110-112.			5/4/2009
1	47	114 University Ave			5/4/2009
1	47	2049 San Pablo Ave			5/4/2009
1	47	2121 San Pablo Ave			5/4/2009
	48	2100 Browning St	?	west berkeley high campus boys gym buildt 1936, adult school with retrofit	

Methodology

First Method

We started by using a on-line searchable database called Mapquest, that takes information from the Alameda County Assessor's Office and allows a subscriber to make queries that include date of construction and type of construction. The type of construction for concrete included brick. We used a City database for URM's and subtracted those. With the URM's eliminated still found the type of construction difficult to interpret as concrete buildings. As a result, we then did some spot checking with Google street view and checked a small sample of buildings by visual inspection. These activities made us less confident in the data. With further interpolation, we finally come up with an estimate.

Second Method

Once we learned of others' successes with the Sanborn maps, we started using that methodology. All 4 volumes of the City of Berkeley Sanborn maps were last updated in April 1981, close to the date of the code change. On the maps, all buildings are labeled as to type of construction. We looked for all building that were colored blue but were not designation as concrete block (C.B.) and all building that were colored brown, which also indicated concrete. We excluded all garages that were accessory to single family homes. Many of the concrete buildings we found are in West Berkeley. As the building official and a City resident, I am aware that some of them have been demolished or retrofitted. This information is obviously not in the Sanborn maps, so we deducted 10% from the total to account for those buildings. We also noted that many of the concrete buildings appear to be institutional and were constructed by governments or educational institutions. The good news is that the City of Berkeley has retrofitted most of its schools and the Martin Luther King, Jr. Civic Center, which serves as City Hall. The survey did not include buildings located on the UC Berkeley Campus.