Initial Seismic Study of Albany USD Schools and Facilities

Prepared for
Albany Unified School District
Albany, CA

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Prepared by
R. P. Gallagher Associates, Inc.
Structural Engineers
Oakland, CA

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1. Introduction

This report summarizes an initial seismic survey of the schools and facilities of Albany Unified School District. The survey consisted of a brief examination of each building and each site for seismic hazards.

The survey was conducted by reviewing the original construction drawings for each building to determine if it has a type of construction which requires further study. Similarly, each site was reviewed for possible geologic site hazards such as liquefaction by reviewing published reports for the area.

The schools and facilities reviewed in the study are as follows:

(1) Ocean View Elementary School
(2) Marin Elementary School
(3) Cornell Elementary School
(4) Albany Middle School
(5) Albany High School
(6) Albany Children's Center
(7) MacGregor High School
(8) District Office
(9) Maintenance Facility.

Pictures of each school and facility reviewed are shown on Figures 1 through 9. While there is often more than one type of building of each campus, the pictures show representative structures, or an important structure discussed in the report.

Background

The California Legislature passed the AB300 legislation in 1999. This required the Division of State Architect (DSA) to perform a state-wide vulnerability inventory of California public schools that were built before July 1, 1978. Buildings with wood frame construction were excluded because of their generally good seismic performance. The results were published in a DSA report to the legislature in 2002 (Ref. 1). Individual buildings were classified according to their seismic force-resisting system and placed in one of the 24 building classifications used (see Table 1 in Appendix A). The classifications were then grouped into two broad categories: Category 1 and Category 2. Category 1 buildings are those buildings expected to perform reasonably well in an earthquake. Category 2 buildings are those requiring further evaluation.

As a result of the AB300 survey, Albany USD was notified by DSA that several of its buildings were in need of further study for possible seismic safety concerns. The purpose of our work was to review and verify the DSA classification for each Albany building on the DSA list, and to examine all District buildings to determine if there were any other Category 2 buildings.

Geologic Site Hazards

The DSA review did not consider seismic-related geologic site hazards such as soil liquefaction, surface faulting through a school site, and slope failures (e.g., landslides) that could jeopardize the safety of school buildings. Geologic site hazards can damage or even destroy otherwise sound buildings. As part of our work, we performed a review of published geohazard literature for the Albany area and also made a visit to each site to view the topography firsthand.

Report Organization

The report is organized as follows. Section 2 summarizes the survey of the school sites for geologic site hazards. Section 3 summarizes our review of the structures at each school site and the District Office and Maintenance Facility. Section 4 summarized our findings and recommendations. Excerpts from the DSA AB300 report to the Legislature are given in Appendix A. These provide: (1) a list of the building seismic vulnerability categories; and (2) the building classification system used.

Figure 1 – Front of Ocean View Elementary School.

Figure 2 – Two buildings at Marin Elementary School.

Figure 3 – West side of Cornell Elementary School.

Figure 4 – Buildings at Albany Middle School.

Figure 5 - Little Theater building at Albany High School.

Figure 6 – Three classrooms at the Albany Children's Center.

Figure 7 – MacGregor High School.

Figure 8 – District Office.

Figure 9 – Maintenance Facility building.

2. Survey of School Sites for Geologic Hazards

Scope of the Investigation

The sites of the various Albany USD schools and facilities were reviewed for seismic-related geologic site hazards such as liquefaction. This was done by using the Tier 1 procedures of ASCE 31 Seismic Evaluation of Existing Buildings (Ref. 2). The principal seismic-related geologic site hazards considered are: liquefaction; surface faulting through a site; and landslide/slope failure. These are potentially harmful to buildings because they can damage otherwise earthquake-resistant structures.

Each site was briefly "surveyed" by reviewing public domain information such as the ABAG Liquefaction Susceptibility maps (Ref. 3) and California Geologic survey fault maps (Ref. 4). We also made a brief visit to each site. The foundation and geotechnical reports used for the original construction could not be found and were therefore not available for us to review. Fortunately, California has required public school construction to be reviewed for geologic site hazards since the 1990's, therefore the sites of Albany schools built after this period can be considered free of significant geologic site hazards. (Review for faulting started in the 1970's after the1971 San Fernando Earthquake.) This information was used to rule out site hazards at sites with relatively new buildings.

Portions of the City of Albany east of Highway I80 have been identified as having possible Low to Moderate susceptibility to liquefaction (Ref. 3). Liquefaction can cause permanent ground movements, both settlements and lateral movements of blocks of soil (i.e., lateral spreading). These can be quite damaging to structures. Figures 10 and 11 illustrate moderate liquefaction damage to houses that were otherwise undamaged by ground shaking after a magnitude 6.3 earthquake. Buildings damaged by liquefaction are often not repairable.

Finally, there was a large geotechnical study done for the University Village in 1997 (Ref. 5). The area of the study included the site of the present District Office and was close to the Ocean View School site. Results of this study were also used in this report.

Findings for Each Site

Results of our review of each site are summarized below. There are no active faults at any of the sites. The closest earthquake fault, and the major seismic threat to the Albany schools and facilities, is the Hayward fault located about one mile east of Albany High School and Marin Elementary School.

1. Ocean View Elementary School: The school is located on 1000 Jackson Street and Buchanan Street on a flat site. The study area of the 1997 University Village report was immediately adjacent to two sides of the Ocean View Site. Within the area of study, the report indicates subsidence due to liquefaction "is not expected to adversely affect foundation support of the residential structures." Also, the report indicated "the potential for lateral spreading occurring at the site is very low." Based on the results of the 1997 study and the proximity of the Ocean View site to the area of the study, the liquefaction risk is believed to be Low.

2. Marin Elementary School: The school is located at 1001 Santa Fe Avenue on a mostly flat site. The ABAG map indicates the risk at the site as Very Low.

3. Cornell Elementary School: Located at 920 Talbot Avenue and Solano Avenue, Cornell school is on a flat site. The ABAG map indicates the liquefaction risk as Low.

4. Albany Middle School: Albany Middle School is located at 1259 Brighton Avenue on a flat, slightly sloping site. The ABAG map indicates Low liquefaction susceptibility. However, because the school was built in the late 1990s, the site was found acceptable for new school buildings by the California Geological Survey. Therefore, no significant liquefaction hazard would be present.

5. Albany High School: Located at 603 Key Route Boulevard, the high school is situated on a flat site. Because a new school was recently built on the site, there is no significant liquefaction risk.

6. Albany Children's Center: The Children's Center is located at 720 Jackson Street on the lower slopes of Albany Hill. The site is sloped. Not unexpectedly because the Center is located at the base of a hill, the ABAG map indicates the liquefaction risk as Very Low. We examined the site, and there are some relatively steep slopes behind the Center. While we saw no evidence of any past slope movement, it is not known if the site would experience any slope failure or landsliding during a large earthquake on the Hayward fault.

7. MacGregor High School: Located at 601 San Gabriel Avenue, the site is across the street from Albany Middle School. The ABAG map indicates the liquefaction risk as Low.

8. District Office: Located at 1051 Monroe Street, the District Office is in modular buildings on a flat site. The area investigated for the 1997 University Village geotechnical report included the site, and the liquefaction risk is considered Low.

9. Maintenance Facility: This is adjacent the Albany Middle School. The site is flat, and because of the facility's proximity to a new DSA-certified school, no significant geologic site hazards are believed to exist.

Discussion of Findings

The Albany sites appear to be generally free of significant site hazards with one possible exception. The Albany Children's Center site has a relatively steep slope at the back of the school, and this should be examined by a geologist or geotechnical engineer for slope stability during a major earthquake.

Figure 10 – Example of liquefaction damage to a house after the magnitude 6.3 February 22, 2011 Christchurch, New Zealand earthquake. The house was undamaged by shaking but seriously damaged by ground movements caused by liquefaction.

Figure 11 – A “tear” in the walls of a house caused by liquefaction-induced ground settlements. This happened when liquefaction caused the house to settle unevenly. Houses in this area will be abandoned. Repair or rebuilding was not feasible.

3. Review of Buildings

Scope of the Investigation

The scope of the building investigation was to evaluate all buildings at District schools and facilities for seismic hazards. This was an initial seismic evaluation and was done by: (1) establishing the construction type of each building; and (2) determining whether the building was a Category 1 or Category 2.

For our work, we identified the construction type of all buildings at each Albany site. Portables and modular buildings were not reviewed. (These were not considered in the AB300 inventory by DSA.) The original construction drawings for each building were reviewed, when these were available, and we also made a brief site visit to examine each building.

Drawings used in our review were obtained from the District office, and when necessary, from the DSA archives in Sacramento (Refs. 5 through 13). Where drawings of a particular building were not available from either source, we gathered information relating to its construction from the construction drawings of adjacent or abutting buildings, or from the drawings of subsequent improvements made after the construction of the original building.

Findings

Our investigation found that 10 Albany school buildings have a Category 2 construction. Table 1 summarizes our findings for each of the District's buildings. Building construction type and AB300 Category are indicated in the two right-hand columns.

Only two of the four Albany buildings identified in the original DSA AB300 inventory as Category 2 were confirmed. Of the remaining two, one has been demolished and the other was found to have Category 1 construction.

Albany Category 2 Buildings

The ten Albany buildings in Table 1 designated Category 2 all have type RM1 construction (Reinforced Masonry with Flexible Roof Diaphragm). The principal seismic concern with this type of building is separation of the walls from the roof. When this happens the roof may collapse locally and/or the walls can fall over due to lack of top support.

Code writers have recognized this as a serious problem, and requirements for tying the walls and the roof together have increased since the problem first occurred in the 1971 San Fernando, CA earthquake. Following the 1994 Northridge, CA earthquake in which over 400 buildings experienced wall-roof separations, the code requirements for these connections was increased dramatically. As a consequence, older buildings, particularly those built in the 1950's, 1960's and 1970's are now considered as potential life safety risks. Actual risk must be confirmed by a more thorough evaluation.

Figures 12 and 13 illustrate wall-roof separations caused by the 1994 Northridge earthquake. What is shown are relatively "moderate" forms of wall-roof separation. In the more life-threatening forms, roofs have collapsed and walls have fallen over.

Figure 12 – An example of wall separation from the roof of a building. When this happens, the walls can fall over, the roof can collapse locally, or both can happen.

Figure 13 – The masonry wall at the right front of this building has pulled away from the roof. This can be a serious problem in buildings with concrete block or tilt-up concrete walls that have wood roofs.

Comments on DSA AB300 List

As mentioned above, four buildings were originally listed as Category 2, but only two were confirmed in our study. Another eight Albany buildings were found to be Category 2. An additional two buildings (at Cornell ES) were Category 2, but these have recently been seismically upgraded. The following is a discussion of our exceptions and additions to the original DSA AB300 list of Category 2 buildings:

(1) Albany High School "Little Theatre". This is also called the Fine Arts Building. This was determined by visual observation to be building classification type to be C2 (Concrete Shear Walls with Rigid Diaphragm). According to Table 2 of the AB300 report (see Appendix A), building classification type C2 is a Category 1 building and not Category 2. This determination was made by field inspection by two structural engineers from our office. The original structural drawings for the building have not been found.

(2) Marin Elementary School. The AB300 Inventory identifies a one-story structure of 4,750 sf with DSA Application No. 18 filed in 1933. Our investigation could not identify this building at the Marin Elementary site, and we believe that this building has been demolished.

(3) Marin Elementary School. Two buildings at this site were identified as having construction type RM1 (Reinforced Masonry Walls with a Flexible Diaphragm), which is deemed Category 2. We agree with the building classification. However, based upon our review of the construction documents and a site visit, a total of seven buildings of this construction type (RM1) are on the site. Therefore, five additional buildings should be added to the list of Category 2 buildings for this site.

(4) Ocean View Elementary School. Originally this was the Albany Middle School campus. It was constructed in 1975. No buildings at this site were cited in the AB300 inventory list. However, based upon our review of the construction documents, the Classroom Buildings, the Library Wing, and the Multi-purpose Wing all have RM1 construction (Reinforced Masonry Walls with a Flexible Diaphragm). Therefore, these should be added to the AB300 list as Category 2 buildings requiring additional seismic investigation.

(5) Two of the original buildings at Cornell Elementary School, the North and South Wings, have a Category 2 construction type (C2A – Concrete Shear Wall with Flexible Diaphragm). However, these have undergone a recent structural/seismic improvement (see Table 2) and are no longer considered Category 2. The South Wing is indicated as being upgraded to the 1995 CBC (Ref. 10) and the North Wing to the 1998 CBC (Ref. 11).

Portables and Modular Buildings

The District has a number of portable classrooms and modular buildings used for classrooms and offices. These are summarized on Table 3. The DSA AB300 inventory did not include portable classrooms and modular buildings.

Table 1 – Albany Unified School District Buildings

School Name	Building Name	DSA App. No.	Year Built	No. of Stories	Area sf	AB300 Classif.	AB300 Category
Ocean View Elementary School	Classroom Bldgs	37636	1975	1	48,569 total	RM1	Category 2
	Library Wing	37636	1975	1		RM1	Category 2
	Multi-Purpose Wing	37636	1975	1		RM1	Category 2
Marin Elementary School (1)	Bldg A	36252	1973	1	3,455	RM1	Category 2
	Bldg B	36252	1973	1	3,215	RM1	Category 2
	Bldg C	36252	1973	1	4,265	RM1	Category 2
	Bldg D	36252	1973	1	3,215	RM1	Category 2
	Bldg E	36252	1973	1	3,215	RM1	Category 2
	Bldg F	36252	1973	1	3,215	RM1	Category 2
	Bldg G	36252	1973	1	3,215	RM1	Category 2
	Bldg H	Unk.	Unk.	1	Unk.	W2	N/A
Cornell Elementary School	South Wing	6379	1948	2	13,397	C2A	(2)
	North Wing	7859	1950	1 & 2	8,688	C2A	(2)
	Admin. Wing	37558	1974	2	7,800	W2	N/A
Albany Middle School	Gymnasium	66999	1997	1	9,248	S2A	(3)
	Area "A" Classroom Bldg.	66999	1997	1	8,212	S2A	(3)
	Area "B" Classroom Bldg.	66999	1997	2	25,931	S2A	(3)
	Area "C" Classroom Bldg.	66999	1997	2	20,515	S2A	(3)
	Food Service	66999	1997	1	4,228	RM1	(3)
Albany High School	Gymnasium	01-100881	1999	1	14,800	S2A	(3)
	Locker Rooms	01-100881	1999	2	13,154	S2/S2A	(3)
	Middle Lobby	01-101194	1999	2	2,272	S2/S2A	(3)
	Classroom Bldg.	01-101234	1999	3	86,974	S2/S2A	(3)
	Fine Arts Bldg (4)	26378	Unk.	2	17,185	C2	Category 1
	Multi-purpose Bldg.	26378	Unk.	1	11,333	W2	N/A
Albany Children's Center	Admin/Classrooms	Unk.	Unk.	1	Unk.	W2	N/A
MacGregor High School	Admin/Classrooms	Unk.	Unk.	1	Unk.	W2	N/A
District Maintenance Facility	Main Bldg	N/A	Unk.	1	Unk.	W2	N/A
	Garage/Storage	N/A	Unk.	1	Unk.	W1	N/A

Notes:
(1) Only two of the seven Category 2 buildings at Marin ES buildings were identified on the original DSA AB300 list.
(2) Building recently seismically upgraded. It was Category 2 before the upgrade.
(3) Constructed after July 1, 1978. AB300 doesn't apply.
(4) Designated Category 2 on original DSA AB300 list.
(5) Unk. = unknown, N/A = not applicable.

Table 2 – Structural/Seismic Improvements to Category 2 Buildings

School Name	Building Name	DSA App. No.	Structural Improvements	DSA App. No. for Improvements	Date of Improvements
Cornell Elementary	South Wing	6379	Yes	68123	1997
Cornell Elementary	North Wing	7859	Yes	01-103317	2001

Table 3 – Portables and Modular Buildings

Site	No. of Portables	No. of Modular Buildings
Ocean View ES	3	2
Marin View ES	–	2
Cornell ES	2	3
Albany MS	1	–
Albany HS	–	–
Albany Children's Center	2	–
MacGregor HS	2	1
District Office	–	1
Maintenance Facility	–	–

4. Summary and Recommendations

Summary

Buildings at Albany USD schools and facilities were given an initial screening for seismic hazards. This was done by a drawing review by a structural engineer to determine each building's type of construction. Those buildings determined to have AB300 Category 2 type construction (i.e., those requiring further study) are listed in Table 4. The North and South wings at Cornell Elementary School have Category 2 construction, but these had been given a recent seismic upgrade and are not included in Table 4.

The DSA AB300 inventory identified four Albany buildings as Category 2. After review, only two were confirmed. Of the remaining two, one was demolished and one was found to be Category 1. Eight additional buildings were added to the District's list of Category 2 buildings (five at Marin School and three at Cornell School).

The various school and facility sites were also reviewed for possible geologic site hazards such as liquefaction. This was done by a literature review and site visit. Table 5 presents a summary of our findings. We believe most of the Albany sites are free of significant site hazards with the possible exception of the Albany Children's Center, where possible slope failure could not be ruled out by the work of this initial survey.

Recommendations

Based on the work of our initial seismic survey, we recommend that the following be done:

(1) The Category 2 buildings identified in Table 4 should be given an ASCE 31 seismic evaluation for the Life Safety performance level. This will determine if they present a significant risk to students and staff. Buildings with RM1 construction have reinforced masonry walls and wood roofs. A principal seismic concern in this type of building is that the roof can separate from the walls (see Figures 12 and 13). Because the age of the construction (1973–1975) predates the important wall-roof seismic requirements enacted in the building code following the 1994 Northridge, CA earthquake, the buildings should be evaluated for this concern in particular. It should be noted, however, that all of the buildings were designed by the same structural engineer, and the connection details used to connect walls to roof are excellent for the time period. They may prove adequate, but this needs to be determined.

(2) The slope behind the Albany Children's Center should be examined by a licensed geologist or geotechnical engineer to evaluate the stability of the slope in a major earthquake.

(3) While we believe the Little Theater at the High School has type C2 construction and is therefore Category 1, the structural drawings for this building should be obtained and reviewed to confirm this.

(4) To confirm that all Albany portables and modular buildings have an approved seismic design, the documentation of the DSA certification of each should be obtained and reviewed.

Table 4 – Category 2 Albany Buildings

Site	No. Bldgs.	Buildings	AB300 Type Construction
Ocean View ES	3	Classrooms, Library and Multi-Purpose Buildings	RM1 – Reinforced Masonry with Flexible Roof Diaphragm
Marin ES	7	Buildings A thru G	RM1 – Reinforced Masonry with Flexible Roof Diaphragm

Table 5 – Geologic Site Hazard Status

Site	Liquefaction Susceptibility	Faulting Thru Site	Slope Failure Risk
Ocean View ES	Low	None	None
Marin ES	Very Low	None	None
Cornell ES	Low	None	None
Albany MS	None	None	None
Albany HS	None	None	None
Albany Children's Center	Very Low	None	Possible
MacGregor HS	Low	None	None
District Office	Low	None	None
Maintenance Facility	None	None	None

5. References

1. "Seismic Safety Inventory of California Public Schools," A Report to the Governor of California and the California State Legislature, prepared by the Department of General Services, November 15, 2002.

2. ASCE/SEI Standard 31-03, "Seismic Evaluation of Existing Buildings," Structural Engineer Institute, American Society of Civil Engineers, 2003.

3. Association of Bay Area Governments, Liquefaction Susceptability Map, available at: http://gis.abag.gov/website/liquefactionsusceptibility/

4. California Geologic Survey, State of California Special Studies Zones Map, Richmond Quadrangle, Revised Official Map, January 1, 1982.

5. "Geotechnical Study, University Village Redevelopment, University Project No. 91280, Albany, California", report by Geomatrix Consultants, San Francisco, September 24, 1997.

6. Architectural and structural drawings (Sheets A1 to A26, S1 to S21, and ST1 to ST3) for Albany Middle School (now Ocean View Elementary School), Corlett and Spackman Architects, San Francisco, and Shapiro, Okino and Hom and Associates, Structural Engineers, San Francisco, 1975, DSA Application No. 37636.

7. Architectural and structural drawings for Marin Elementary School, Corlett and Spackman Architects, San Francisco, and Shapiro, Okino and Hom and Associates, Structural Engineers, San Francisco, 1973, DSA Application No. 36252.

8. Architectural and structural drawings (Sheets 1 to 26) for Addition to Cornell Elementary School (South Wing), Young and Lloyd Architects, Albany, 1948, DSA Application No. 6379.

9. Architectural and structural drawings (Sheets 1 to 22) for Addition No. 2 Cornell Elementary School (North Wing), Young and Lloyd Architects, Albany, 1950, DSA Application No. 7859.

10. Architectural and structural drawings (Sheets A1 to A8 and S1 to S7) for Cornell Elementary School Administration Wing, Corlett and Spackman Architects, and Shapiro, Okino and Hom Associates, Structural Engineers, San Francisco, 1974, DSA Application No. 37558.

11. Architectural and structural drawings (Increment 1 sheets A1 to A2 and S1 to S2, and Increment 2 sheets A1 to A2 and S1) for Cornell Elementary School Structural Upgrade (South Wing), Deems, Lewis, McKinley Architecture, San Francisco, 1997, DSA Application No. 68123.

12. Architectural and structural drawings (Sheets A1.1 to A5.5 and S1 to S2) for Seismic Upgrade and Modernization of Cornell Elementary School North Wing, Deems, Lewis, McKinley Architecture, San Francisco, 2001, DSA Application No. 01-103317.

13. Architectural and structural drawings for Albany High School, Deems, Lewis, McKinley Architecture, San Francisco: Portion 1, 1999, DSA Application No. 100879; Portion 2, 1999, DSA Application No. 01-100881; Portion 3, 1999, DSA Application No. 101234; and Modernization, 1999, DSA Application No. 01-101194.

14. Structural drawings (Sheets S1 to S17) for Albany Middle School, Deems, Lewis, McKinley Architecture, San Francisco, 1998, DSA Application No. 66999.

Appendix A

Excerpts from the 2002 DSA AB300 Report

Table 1. Building Classification System for Seismic-Safety Inventory of California Public Schools

Alpha-Numeric Reference Code	Brief Description
C1	Concrete moment frames
C1B	Reinforced concrete cantilever columns with wood roofs
C2	Concrete shear wall with rigid floor and roof diaphragms
C2A	Concrete shear wall with flexible floor and roof diaphragms
C3	Concrete frame with infill masonry shear walls and concrete floor and roof diaphragms
C3A	Concrete frame with infill masonry shear walls and flexible floor and roof diaphragms
M	Mixed construction containing a combination of two or more of the other structure types defined in this table
PC1	Precast tilt-up concrete shear wall with concrete floor and roof diaphragms
PC1A	Precast tilt-up concrete shear wall with flexible floor and roof diaphragms
PC2	Precast concrete frame with concrete shear walls and rigid floor and roof diaphragms
PC2A	Precast concrete frame without concrete shear walls and with rigid floor and roof diaphragms
RM1	Reinforced masonry bearing wall with flexible floor and roof diaphragms
RM2	Reinforced masonry bearing wall with stiff floor and roof diaphragms
S1	Steel moment frame with rigid floor and roof diaphragms
S1A	Steel moment frame with flexible floor and roof diaphragms
S1B	Steel cantilever columns with wood roofs
S2	Steel braced frame with rigid floor and roof diaphragms
S2A	Steel braced frame with flexible floor and roof diaphragms
S3	Steel light frame with metal siding and/or rod bracing
S4	Steel frames with concrete shear walls
S5	Steel frames with infill masonry shear walls and concrete floor and roof diaphragms
S5A	Steel frame with infill masonry shear walls and wood floor and roof diaphragms
URM	Unreinforced masonry bearing wall with flexible floor and roof diaphragms
URMA	Unreinforced masonry bearing wall with rigid floor and roof diaphragms

Chapter 3. INVENTORY RESULTS

3.1 Building Seismic Vulnerability Categories

As the initial step in analyzing and interpreting the results from the seismic-safety inventory of California public schools, the Project Advisory Panel reviewed the list of building types included in the inventory (Table 1) and divided them into two seismic vulnerability categories:

Category 1: those building types that are likely to perform well[2], based on their performance in prior earthquakes, and are expected to achieve life-safety performance in future earthquakes; and

Category 2: those building types that are not expected to perform as well as Category 1 building types in future earthquakes and that require detailed seismic evaluation to determine if they can be expected to achieve life-safety performance when subjected to earthquake ground motions equivalent to those specified for new design in the 1997 UBC.

If, after detailed seismic evaluation, it is determined that a Category 2 building will not achieve life-safety performance when subjected to the specified ground motions, several risk reduction options are available, including (1) seismically rehabilitating the building to meet DSA's life-safety requirements, (2) a change in use, or (3) demolition.

Table 2 contains a listing of the building types in each seismic vulnerability category.

Table 2. Building Types by Seismic Vulnerability Category* (Seismic-Safety Inventory of California Public Schools)**

Category 1: Building Types Expected to Perform Well in Future Earthquakes	Category 2: Building Types Requiring Detailed Seismic Evaluation
	C1, C1B, C2A, C3A,
C2, C3	M
S1, S1A, S2, S2A, S4, S5, S5A	S1B, S3
RM2	PC1, PC1A, PC2, PC2A
	RM1, URM, URMA

*Excludes consideration of the seismic performance of nonstructural components.
**Non-wood-frame schools designed before July 1, 1978.

3.2 Summary and Interpretation of Inventory Data

Because the seismic-safety inventory data are archived in a relational database, it is possible to summarize the data in a wide variety of ways. Table 3 provides a summary of the number of school buildings by building type, vulnerability category, and square footage. Based on this table, 78 percent of the buildings, and 71 percent of the square footage, are building types in

[2] Performance in future earthquakes is estimated, not guaranteed, and not to be construed to be a warrant.