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# Identifying Potential Earthquake Dangers To Alaska's Students and Schools

A Pilot Project Screening Matanuska-Susitna School District Buildings

February 6, 2015

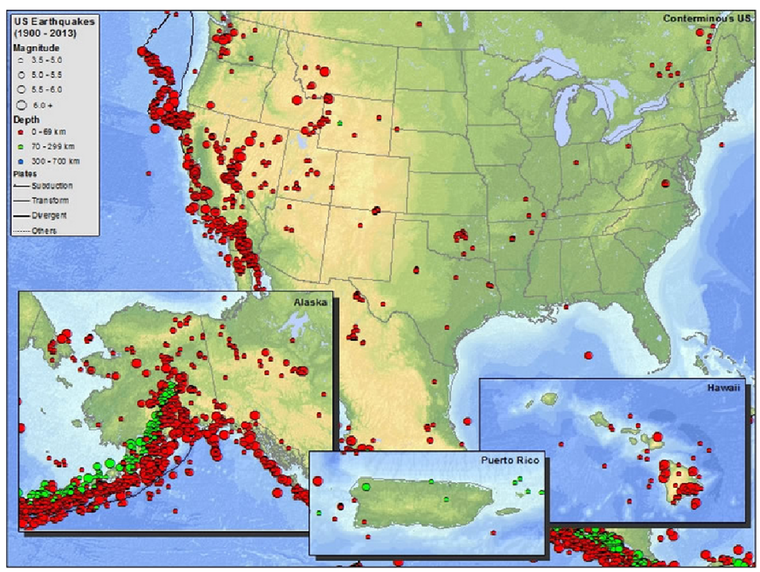
Study Conducted by: BBFM Engineers, Inc.

Sponsored by:

| The Federal Emergency Management Agency (FEMA) | The Department of Homeland Security (DHS) | The Earthquake Engineering Research Institute (EERI) | The Alaska Seismic Hazards Safety Commission (ASHSC) |
|---|---|---|---|

**Alaskan Seismicity:**

Alaska is among the most seismically active areas on Earth. Over the past 50 years, the United States Geological Survey (USGS) recorded in the United States more than 3,000 earthquakes more powerful than magnitude 5, with approximately 80% of these occurring in Alaska. Further, of the twelve most powerful earthquakes America has ever experienced, ten were situated in Alaska. These include the 1964 Great Alaska Earthquake, which remains the second most powerful ever measured on Earth.




*Sites of major earthquakes in the US*

Alaska's intense seismicity is a result of plate tectonics. The Pacific Plate, moving north 2" to 3" per year, slides below the North American Plate at a fault called the Aleutian Megathrust. This tectonic collision and subduction is able to produce an earthquake up to magnitude 9.2, according to the Federal Emergency Management Agency (FEMA). Many other faults occur around the state, and

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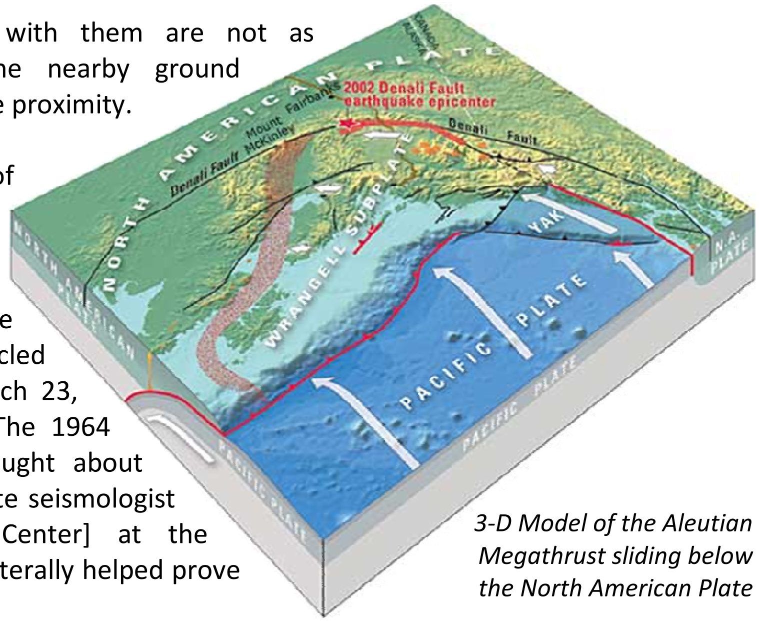
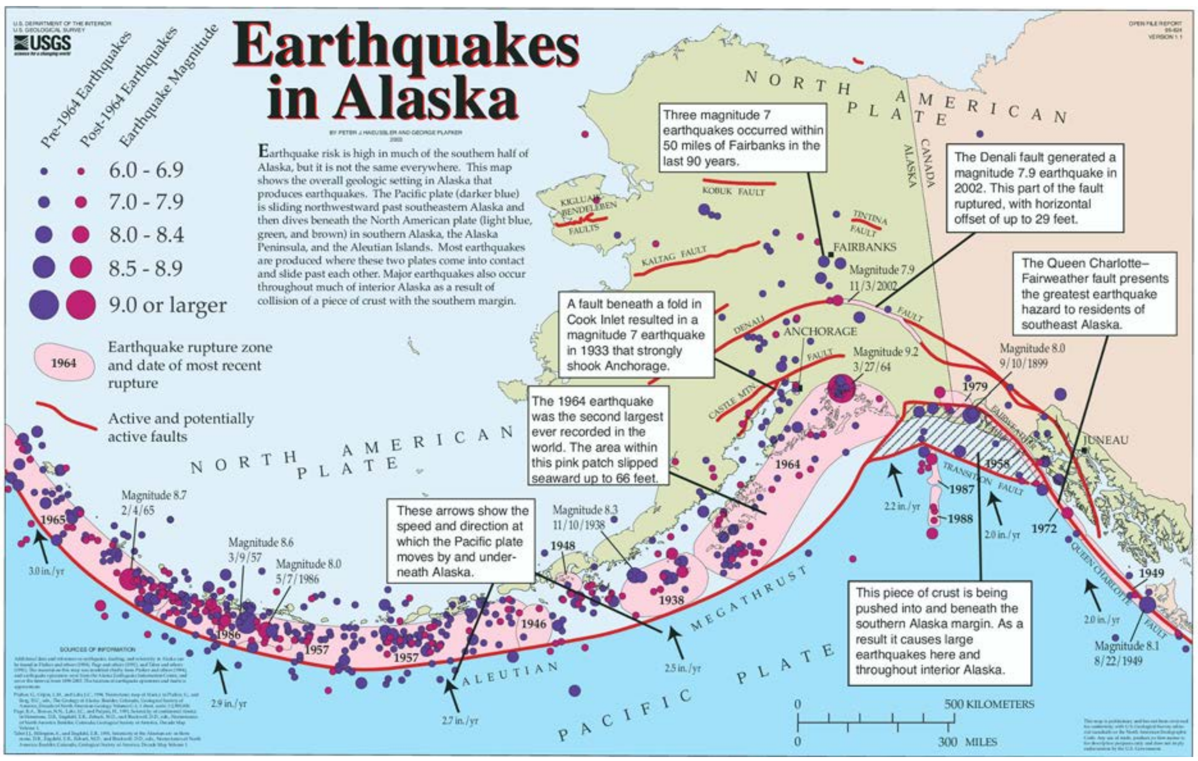
though earthquakes associated with them are not as powerful, they may govern the nearby ground accelerations because of their close proximity.

The strength and duration of Alaska's 1964 earthquake shocked the scientific world, spurring an increase in research in plate tectonics and seismology. The Alaska Dispatch News has chronicled many of these changes in a March 23, 2014 article on the subject: "'The 1964 event changed the way we thought about earthquakes,' said Mike West, state seismologist with the [Alaska Earthquake Center] at the University of Alaska Fairbanks. 'It literally helped prove plate tectonics.'"




*3-D Model of the Aleutian Megathrust sliding below the North American Plate*




*Alaskan seismicity: faults, earthquakes, and rupture zones*

**Building Codes:**

Similarly, the 1964 Alaskan earthquake substantially changed the way building structures are designed. In 1973, the Uniform Building Code was modified to add many new, specific requirements. For example, descriptions of seismic force collectors within floors and roofs were added, as were new detailing requirements for seismic safety in regions of high seismicity. Design seismic forces for braced frames effectively doubled; unreinforced masonry and concrete were now prohibited for all structural elements in regions of high seismicity; gravity-only columns now needed to be designed to have sufficient strength when swaying dramatically during a seismic event.

Since then, building codes have continued to be modernized. In response to observations after other earthquakes, and informed by extensive testing, building code committees have continued to increase design seismic forces, establish more robust detailing requirements, and intensify inspection mandates. Schools in particular are now designed for an increased factor of safety because of their importance to their communities. Further, in some cases schools are designed to an even higher level of safety so they can be used as shelters following a major earthquake. Because of these changes and many others, buildings constructed today are much more earthquake-resistant than older buildings.

The fact that older buildings are less earthquake-resistant is significant to Alaskan schools because many of them were constructed before building code modernization began to improve the safety of building construction. As a result, older school buildings are typically less earthquake-safe than newer ones. How much less safe depends on many factors, including age and type of structural system, structural irregularities, building location, and quality of construction. School districts and managers of facilities would benefit greatly from having good information readily available regarding the safety of their facilities. This would enable them to make informed decisions regarding timing and urgency of any further structural reviews and upgrades.

*Government Hill Elementary School after the 1964 Earthquake*

**Rapid Evaluation of Facilities:**

To that end, FEMA developed a rapid evaluation procedure outlined in their publication P-154, "Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook." This contains a method for evaluating structures' seismic performance very quickly and without great expense, referring to it as a "sidewalk survey." It takes into account the age and type of structure, building height, irregularities in the structure that decrease reliability, and whether it was constructed before the enforcement of design codes and the implementation of construction inspection. FEMA developed this method to provide a tool to give building owners and managers good, actionable information with minimal up-front cost. The second edition of FEMA P-154 is also available in a program called ROVER (Rapid Observation of Vulnerability and Estimation of Risk), which runs on mobile devices and uploads data and results wirelessly to a central server. An added advantage of ROVER is that the database it establishes can be used after a major earthquake. The database can contain both building plans as well as photographs of the building in its pre-earthquake condition.

The way ROVER evaluates a building is quite straightforward. It establishes an initial score for each type of structural system (wood shear walls, steel braced frame, and so forth), with a higher score indicating greater reliability. A given building's initial score is then modified (up or down) based on other factors, including the number of stories, vertical structural irregularities, plan structural irregularities, probable soil type, whether it was designed and constructed before codes were generally enforced, and whether it was designed and constructed under substantially modern codes. The user enters the building information, and ROVER adds and subtracts from the initial score to obtain the final score. FEMA carefully selected the scores and modifications so the final score could carry some readily understandable information: a score of 2 would indicate the building has roughly one chance in 100 of collapse during a major earthquake; a score of 3 would indicate one chance in 1000, and so on. BBFM Engineers makes no statement about these probabilities except to note FEMA's intent in developing the scoring process. Typically a final score below 2.0 is taken as indication that a more detailed investigation is warranted, although that value can be adjusted at the outset of an evaluation project as desired by the owner of the facilities.

**Alaskan School Safety:**

As stated in 2010 by the Western States Seismic Policy Council (WSSPC), "Every community is required to educate children, and it is the responsibility of governmental agencies to design and construct safe buildings to house them. While current building codes and construction practices have recognized the effects of earthquakes and provide state-of-the-art design considerations, many older school buildings were built before these principles were understood… These older buildings have not been properly graded or passed the test of seismic safety. Consequently, many students face significant seismic risk." The WSSPC is a non-profit consortium of eighteen member states and territories including Alaska.

After all, since children are required to attend school and parents lack specific information about the seismic safety of different structures, it is the responsibility of the government to ensure the schools provide a safe learning environment for Alaskan children. Again, schools may be used as emergency shelters after major earthquakes, further raising the importance of the building's successful performance during an earthquake.

According to the Alaska Department of Education, in the 2013-2014 school year there were more than 130,000 students in Alaska. School districts statewide accept as part of their mission to protect the safety of children and the facilities, whose replacement cost is many billions of dollars.

**This Study:**

This study was funded by FEMA and managed by the Earthquake Engineering Research Institute (EERI) and the Alaska Seismic Hazards Safety Commission (ASHSC). It is the goal of FEMA and of EERI to improve earthquake safety throughout the country, and for that purpose they are sponsoring pilot projects in various states to showcase the ease and value of rapid visual observation of schools.

Two goals reside at the core of this study: to show planners how quickly and cost effectively an initial assessment can be performed for schools using ROVER's rapid visual assessment program, and to rate a sampling of existing schools to provide the Matanuska-Susitna School District information crucial to their planning purposes. Any buildings of concern can then be prioritized for further study and/or upgrade, as appropriate.

ASHSC looked for a school district with older schools constructed with a variety of structural system types and found a willing participant in the Matanuska-Susitna School District, home to some 14% of Alaska's students. Bob Bechtold of the Matanuska Susitna Capital Planning Office prepared a list of schools and provided electronic drawings for each. In preparation for the review of the schools, BBFM Engineers obtained the software necessary to establish one office computer as the online server, which BBFM now maintains on behalf of ASHSC. BBFM also became familiar with the method of using phones and other portable devices to link up with the server and transfer information back and forth.

BBFM reviewed the following seven schools: Big Lake Elementary, Butte Elementary, Cottonwood Creek Elementary, Snowshoe Elementary, Swanson Elementary, Willow Elementary, and Wasilla High School. While still at the office, BBFM Engineers reviewed the available structural drawings and began an entry for each in the online server's database, inputting all available information: location in relation to known seismic faults, structural system type, year of construction, and more. BBFM then visited these seven schools, photographing their current condition and noting any conditions not shown on the drawings and materials that, during an earthquake, could become falling hazards. This information was later entered into the online server. It should be noted that, although seven schools were reviewed, because several schools have a number of additions, the total number of separate structures reviewed comes to seventeen.

*Cottonwood Creek Elementary School*

**Cost of this Study:**

The total cost of this study was approximately $18,500. Of this, BBFM Engineers was paid $8500 for this study, resulting in a donated effort of approximately $10,000. Of this, $4275 was spent on setting up the server and becoming acquainted with the software. Another $8145 was spent reviewing drawings, visiting the schools, and entering data into the server. Finally, a little over $6000 was spent preparing this report.

Future rapid seismic evaluations will not need to include funds for setting up the server, becoming acquainted with software, or addressing most of the subject matter contained in this report. In fact, for remote schools with available structural drawings, school staff could provide the photographs electronically, eliminating even the need to send an engineer to the building. As a result, future studies could be performed for a very minimal cost, approximately $600 to $800 per original structure or addition, plus costs associated with transportation.

For this pilot project, we chose to upload the available structural drawings for all the elementary schools. Using the ROVER server for this purpose was cumbersome, as each drawing had to be converted into a picture format and uploaded individually. While it would be very advantageous to have these drawings readily accessible after a major earthquake, a better solution would be for the drawings to be uploaded in a multi-page pdf format, which is the standard for the industry. Although ROVER cannot accept such files, it can accept a link to a file storage location on the cloud. While making file transfer more standard and efficient, this would also improve reliability, as the drawings would be stored farther from the disaster necessitating their use. Likewise, the ROVER site could also be located on the cloud to protect its database from the effects of a major earthquake.

**Results of the Study:**

Of the seventeen structures reviewed, the final scores range from 0.3 to 4.8. According to FEMA's guidelines, these should represent preliminary collapse probabilities of 50% and 0.002%, respectively. These probabilities are substantially impacted by building design and construction practices common at the time, which may differ from the practices used on these particular structures. Eight structures exhibited scores below 2.0, indicating further review is necessary. Additionally, a potential pounding/falling materials hazard was identified at a ninth structure. Here are the results for each school:

1) Big Lake Elementary School: 1963 Original Construction
   - Wood construction
   - Final score = 2.3; FEMA estimate of collapse risk: 0.5%
   - no additional review is indicated

2) Big Lake Elementary School: 1978 Addition
   - Wood construction
   - Final score = 4.7; FEMA estimate of collapse risk: 0.002%
   - no additional review is indicated

3) Big Lake Elementary School: 1983 Addition
   - Wood construction
   - Possible pounding with entry canopy
   - Final score = 2.3; FEMA estimate of collapse risk: 0.5%
   - Additional review is required for the possible pounding with the entry canopy

4) Butte Elementary School: 1978
   - Wood construction
   - Final score = 4.8; FEMA estimate of collapse risk: 0.002%
   - no additional review is indicated

5) Cottonwood Creek Elementary School: 1981
   - Wood construction
   - Final score = 4.8; FEMA estimate of collapse risk: 0.002%
   - no additional review is indicated

6) Snowshoe Elementary School: 1978
   - Wood construction
   - Final score = 4.8; FEMA estimate of collapse risk: 0.002%
   - no additional review is indicated

7) Swanson Elementary School: 1950's Original Construction
   - Lateral system appears to be concrete floors supported by plywood shear walls
   - Original construction was single story; later a second floor was added
   - Final score = 1.4; FEMA estimate of collapse risk: 4%
   - Additional review is required

8) Swanson Elementary School: 1958 Addition
   - Lateral system appears to be concrete floors supported by plywood shear walls
   - Original construction was single story; later a second floor was added
   - Final score = 1.4; FEMA estimate of collapse risk: 4%
   - Additional review is required

9) Swanson Elementary School: 1963 Addition
   - Lateral system appears to be concrete floors supported by plywood shear walls
   - Original construction was single story; later a second floor was added
   - Final score = 1.4; FEMA estimate of collapse risk: 4%
   - Additional review is required

10) Swanson Elementary School: 1994 Addition
   - Lateral system appears to be concrete floors supported by plywood shear walls
   - Original construction was single story; later a second floor was added
   - Final score = 3.2; FEMA estimate of collapse risk: 0.06%
   - Additional review is required

11) Willow Elementary School: 1961 Original Construction
   - Wood construction
   - Final score = 2.5; FEMA estimate of collapse risk: 0.3%
   - No additional review is indicated

12) Willow Elementary School: 1976 Addition
   - Masonry construction
   - Final score = 2.3; FEMA estimate of collapse risk: 0.5%
   - No additional review is indicated

13) Willow Elementary School: 1987 Addition
   - Masonry construction
   - Final score = 1.7; FEMA estimate of collapse risk: 2%
   - Additional review is required

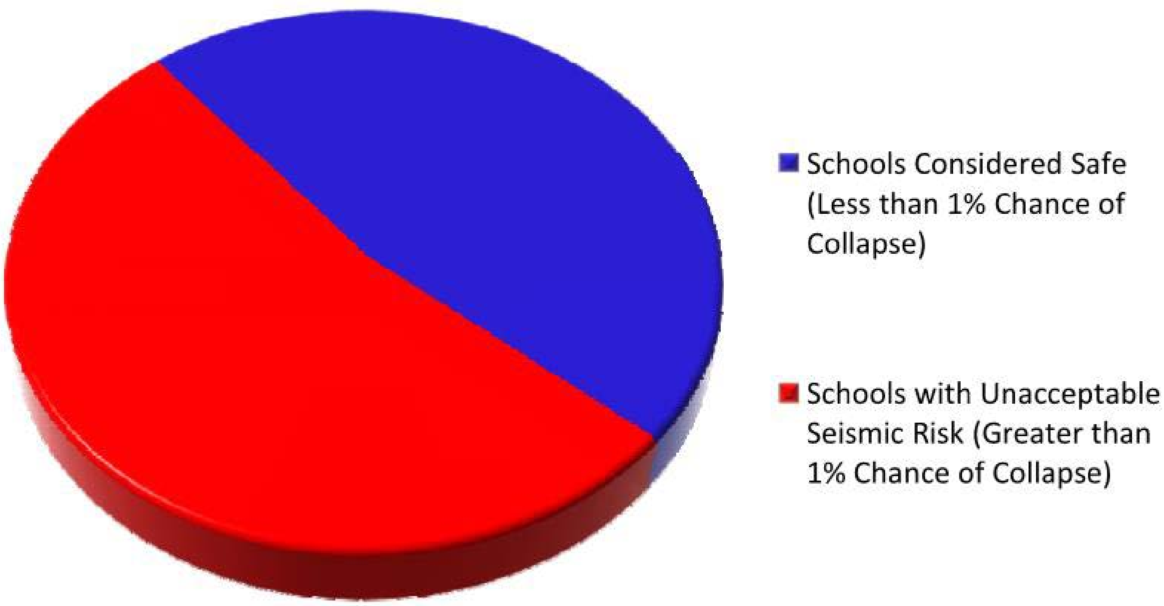
14) Wasilla High School: 1974 Original Construction
   - Masonry and concrete shear walls construction

- Final score = 1.6; FEMA estimate of collapse risk: 3%
  Additional review is required

15) Wasilla High School: 1979, West Classroom Addition
    - Steel braced frame and steel moment frame construction
    - Final score = 1.9; FEMA estimate of collapse risk: 1.3%
    - Additional review is required

16) Wasilla High School: 1979, Entry Addition
    - Steel frame tied to existing building construction
    - Final score = 1.6; FEMA estimate of collapse risk: 3%
    - Additional review is required

17) Wasilla High School: 1979, East Addition With Pool
    - Precast and masonry construction
    - Final score = 0.3; FEMA estimate of collapse risk: 50%
    - Additional review is required




With relatively little time or expense, this study has identified many structures that would be expected to perform well during a major earthquake, largely due to modern building code requirements and construction practices.

At the same time, this study also quickly and cost-effectively identified many other structures that may perform poorly during a major earthquake. The schools appear to pose a significant risk to students in the Matanuska-Susitna School District and to the communities they serve. Of the seventeen original buildings and additions, nine are indicated to pose unacceptable risks requiring further structural attention. In other words, 53% of the structures reviewed in this study pose an unacceptable risk of collapse during a major earthquake. The three largest contributors to a building's seismic risk are: a) common industry practices when the structure was built, b) type of structural system, and c) the presence of and type of structural irregularities.

The study of these schools in the Matanuska-Susitna School District indicates there would be great value in conducting a similar study statewide, where more than 500 public schools serve kindergarten through twelfth grade. It is the responsibility of school districts and school boards, as well as local and statewide governing bodies to reduce the risk earthquakes currently pose to students and facilities alike, and this rapid evaluation method would quickly and economically identify those structures requiring further attention.

In a December 17 interview aired by the Alaska Public Radio Network, Alaska Governor Bill Walker pointed out that the tightness of today's Alaskan economy requires policymakers to be particularly focused on our state's priorities, and that education is a high priority. Fortunately, structural review and upgrade is truly one area where "a stitch in time saves nine." Over time, the cost of not upgrading a deficient structure typically exceeds the cost of improving the structure before a major earthquake hits, and even more so when lives and disruption to society are factored in.

**Effectiveness of Seismic Retrofit:**

Various earthquakes have shown that seismic retrofits to a building can substantially improve its performance during a major earthquake. For example, the 2001 Nisqually Earthquake near Olympia, Washington produced peak ground accelerations 10% to 30% as strong as the acceleration due to gravity. Reviewing the aftermath, the California Seismic Safety Commission determined that "One hundred and one schools and buildings had been retrofitted for structural components and seven had been retrofitted for non-structural components in the Seattle Public Schools District when the Nisqually earthquake occurred. None of the districts schools suffered significant structural damage. Non-structural damage to colleges and universities included toppling of bookcases and the localized flooding due to a ruptured water line. Some primary and secondary schools in Olympia and Seattle suffered limited structural (damaged beams and columns) and non-structural damage from strong ground shaking."

*Nisqually earthquake damage at a building without seismic retrofit*

A second example is the magnitude 6 earthquake that struck Napa, California in 2014, producing peak ground accelerations of 60% to 100% as strong as the acceleration due to gravity. The earthquake and its aftershocks injured 90 people and caused approximately $1 billion of damage. Engineering News-Record reported on September 3, 2014:

> The epicenter of the American Canyon quake was at the heart of the Napa school district's 30 campuses. Subsequently, three architectural and engineering teams

assessed "every room in every school" and observed no structural damage following the quake, says Mark Quattrocchi, principal of Kwok Quattrocchi Architects and one of the survey team members… The schools performed so well because they are built or retrofitted according to much stricter seismic codes than commercial and residential buildings.

*Napa earthquake damage to a building without seismic retrofit*

"There was no structural damage to any school in the district, even the ones built to older codes in the 1940s, 1950s and 1960s," says Quattrocchi. "Part of this is because seismic upgrades at the schools are treated the same as building an entirely new facility," he adds.

Schools fared well for three reasons: seismic building codes that are more stringent than those for commercial buildings, methodical reviews by the Division of the State Architect and "full-time" state inspection on school construction sites, Quattrocchi says."

For buildings shown to be vulnerable to collapse during earthquakes, seismic retrofit can substantially improve the buildings' performance during a major earthquake.

We urge planners and policymakers to implement a program to assess rapidly and inexpensively (only costing about $600 to $800 per structure plus transportation as needed) the vulnerability of schools to earthquakes, both for the safety of the students and to protect financial investments across the state. An added benefit of using the ROVER program is that it develops a database of critical information readily available after a major earthquake. We also encourage further structural review and possible seismic retrofit for the ten structures identified in this report as posing unacceptable seismic risk.

BBFM Engineers

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# Earthquake Danger to Alaska's Students and Schools
# Appendix A

## Scoring Sheets for ROVER

Dennis L. Berry, PE | Troy J. Feller, PE | Colin Maynard, PE | Scott M. Gruhn, PE

3/16/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form — HIGH Seismicity

Address:3808 S Big Lake Rd
Zip: 99652
Other Identifiers:
No Stories: 2
Year Built: 1963
Screener: 1
Date: None
Total Floor Area (sq. ft.): 57240
Building Name: **Big Lake Elementary 1963 Original Construction**
Use: None

No Sketch

No Photograph

**Occupancy**

| | | |
|---|---|---|
| ☐ Assembly | ☐ Govt | ☐ Office |
| ☐ Commercial | ☐ Historic | ☐ Residential |
| ☐ Emer. Services | ☐ Industrial | ☑ School |

Number of Persons: ☐ 0-10 ☐ 11-100 ☑ 101-1000 ☐ 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

**Falling Hazard**

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding
Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.6 | 2.7 | 2.9 | 3.1 | 2.7 | 1.7 | 2.4 | 2.7 | 1.3 | 2.5 | 2.3 | 2.7 | 2.7 | 1.5 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ☑ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 2.3 | | | | | | | | | | | | | |

Comments:
See 1978 Addition for photos and plans

Detailed Evaluation Required ☐

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

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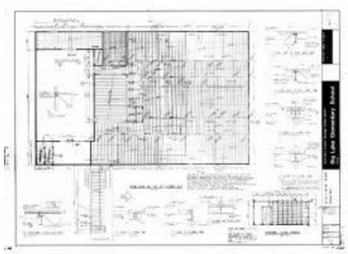
2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity



Address:3808 S Big Lake Rd
Zip: 99652
Other Identifiers:
No Stories: 2
Year Built: 1976
Screener: 1
Date: None
Total Floor Area (sq. ft.): 57240
Building Name: **Big Lake Elementary**
Use: None


**Occupancy**

- [ ] Assembly
- [ ] Govt
- [ ] Office
- [ ] Commercial
- [ ] Historic
- [ ] Residential
- [ ] Emer. Services
- [ ] Industrial
- [x] School

Number of Persons

- [ ] 0-10
- [ ] 11-100
- [x] 101-1000
- [ ] 1000+

**Soil Type**

- [ ] A Hard Rock
- [ ] B Avg. Rock
- [ ] C Dense Soil
- [x] D Stiff Soil
- [ ] E Soft Soil
- [ ] F Poor Soil

**Falling Hazard**

- [ ] Unreinforced Chimneys
- [ ] Parapets
- [ ] Cladding

Other: Possible pounding at entry ca

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.6 | 2.7 | 2.9 | 3.1 | 2.7 | 1.7 | 2.4 | 2.7 | 1.3 | 2.5 | 2.3 | 2.7 | 2.7 | 1.5 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | [x] -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | [x] 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | [x] -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 4.7 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required

- [ ] 

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
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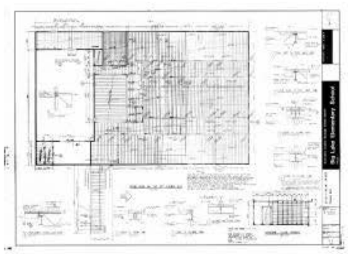
http://192.168.254.253:8000/Rover/worksheet/printable_site/1 1/1

2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity



Address:3808 S Big Lake Rd
Zip: 99652
Other Identifiers:
No Stories: 2
Year Built: 1976
Screener: 1
Date: None
Total Floor Area (sq. ft.): 57240
Building Name: **Big Lake Elementary**
Use: None


**Occupancy**

Assembly | Govt | Office
Commercial | Historic | Residential
Emer. Services | Industrial | School ✓

Number of Persons: 0-10 | 11-100 | 101-1000 ✓ | 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| | | | ✓ | | |

**Falling Hazard**

Unreinforced Chimneys | Parapets | Cladding

Other: Possible pounding at entry ca

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.6 | 2.7 | 2.9 | 3.1 | 2.7 | 1.7 | 2.4 | 2.7 | 1.3 | 2.5 | 2.3 | 2.7 | 2.7 | 1.5 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ✓ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | ✓ 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ✓ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 4.7 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

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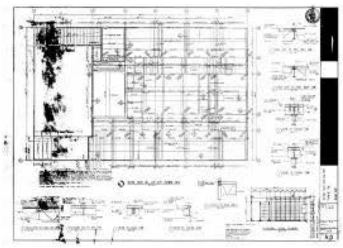
2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity



Address:4006 Butte Rd
Zip: 99645
Other Identifiers:
No Stories: 2
Year Built: 1978
Screener: 1
Date: None
Total Floor Area (sq. ft.): 49550
Building Name: Butte
Use: None


### Occupancy

Assembly | Govt | Office | Commercial | Historic | Residential | Emer. Services | Industrial | ☑ School

Number of Persons: 0-10 | 11-100 | ☑ 101-1000 | 1000+

### Soil Type

A Hard Rock | B Avg. Rock | C Dense Soil | ☑ D Stiff Soil | E Soft Soil | F Poor Soil

### Falling Hazard

Unreinforced Chimneys | Parapets | Cladding

Other:

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | ☑ 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ☑ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 4.8 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
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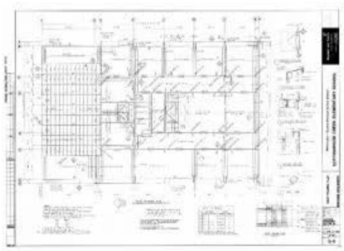
2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form — HIGH Seismicity



Address:800 N Seward Meridian Pkwy
Zip: 99654
Other Identifiers:
No Stories: 2
Year Built: 1981
Screener: 1
Date: None
Total Floor Area (sq. ft.): 53390
Building Name: **Cottonwood Creek**
Use: None


### Occupancy

- [ ] Assembly - [ ] Govt - [ ] Office
- [ ] Commercial - [ ] Historic - [ ] Residential
- [ ] Emer. Services - [ ] Industrial - [x] School

Number of Persons
- [ ] 0-10 - [ ] 11-100
- [x] 101-1000 - [ ] 1000+

### Soil Type

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| [ ] | [ ] | [ ] | [x] | [ ] | [ ] |

### Falling Hazard

- [ ] Unreinforced Chimneys - [ ] Parapets - [ ] Cladding

Other:

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | [x] -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | [x] 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | [x] -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 4.8 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required [ ]

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
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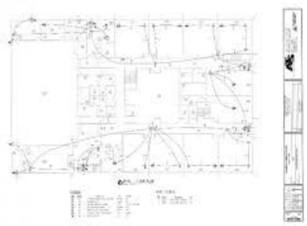
http://192.168.254.253:8000/Rover/worksheet/printable_site/3 1/1

# Rapid Visual Screening of Buildings for Potential Seismic Risk
# FEMA-154 Data Collection Form HIGH Seismicity

Address:2001 West Fairview Loop
Zip: 99654
Other Identifiers:
No Stories: 2
Year Built: 1978
Screener: 2
Date: None
Total Floor Area (sq. ft.): 50510
Building Name: Snowshoe Elementary
Use: None




**Occupancy**

- Assembly
- Govt
- Office
- Commercial
- Historic
- Residential
- Emer. Services
- Industrial
- School ✓

Number of Persons: 0-10; 11-100; 101-1000 ✓; 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| | | | ✓ | | |

**Falling Hazard**

Unreinforced Chimneys; Parapets; Cladding
Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ✓ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | ✓ 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ✓ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 4.8 | | | | | | | | | | | | | |

Comments:
Appears to have same floor plan as Cottonwood Creek

Detailed Evaluation Required

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
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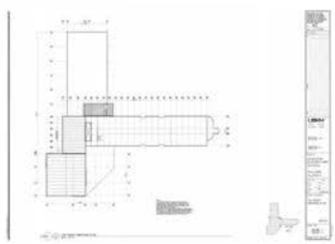

Address:609 N Gulkana St
Zip: 99645
Other Identifiers:
No Stories: 2
Year Built: 1955
Screener: 2
Date: None
Total Floor Area (sq. ft.): 50135
Building Name: **Swanson 1950's, 1958, 1963**
Use: None


**Occupancy**

| | | |
|---|---|---|
| ☐ Assembly | ☐ Govt | ☐ Office |
| ☐ Commercial | ☐ Historic | ☐ Residential |
| ☐ Emer. Services | ☐ Industrial | ☑ School |

Number of Persons: ☐ 0-10 ☐ 11-100 ☑ 101-1000 ☐ 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

**Falling Hazard**

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding

Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | ☑ -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ☑ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 1.4 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required ☑

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
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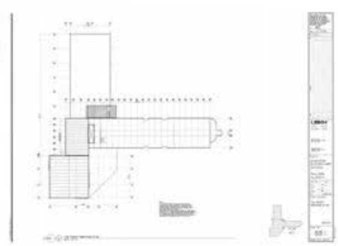
3/16/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity

Address:609 N Gulkana St
Zip: 99645
Other Identifiers:
No Stories: 2
Year Built: 1955
Screener: 2
Date: None
Total Floor Area (sq. ft.): 50135
Building Name: Swanson 1950's, 1958, 1963
Use: None




**Occupancy**

| | | |
|---|---|---|
| Assembly | Govt | Office |
| Commercial | Historic | Residential |
| Emer. Services | Industrial | ☑ School |

Number of Persons: 0-10 | 11-100 | ☑ 101-1000 | 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| | | | ☑ | | |

**Falling Hazard**

Unreinforced Chimneys | Parapets | Cladding

Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | ☑ -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ☑ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 1.4 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required ☑

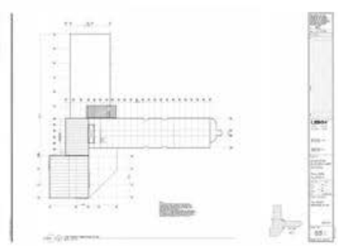
* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

http://192.168.254.253:8000/Rover/worksheet/printable_site/5 1/1

3/16/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity

Address:609 N Gulkana St
Zip: 99645
Other Identifiers:
No Stories: 2
Year Built: 1955
Screener: 2
Date: None
Total Floor Area (sq. ft.): 50135
Building Name: **Swanson 1950's, 1958, 1963**
Use: None




| Occupancy | | | Number of Persons | | Soil Type | | | | | | Falling Hazard |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Assembly | Govt | Office | 0-10 | 11-100 | A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil ✓ | E Soft Soil | F Poor Soil | Unreinforced Chimneys; Parapets; Cladding |
| Commercial | Historic | Residential | 101-1000 ✓ | 1000+ | | | | | | | Other: |
| Emer. Services | Industrial | School ✓ | | | | | | | | | |

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ✓ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | ✓ -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ✓ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 1.4 | | | | | | | | | | | | | |

Comments:

Detailed Evaluation Required ✓

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

http://192.168.254.253:8000/Rover/worksheet/printable_site/5 1/1

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity

Address:609 N Gulkana St
Zip: 99645
Other Identifiers:
No Stories: 2
Year Built: 1994
Screener: 1
Date: None
Total Floor Area (sq. ft.): 50135
Building Name: **Swanson 1994**
Use: None

No Sketch

No Photograph

**Occupancy**

☐ Assembly ☐ Govt ☐ Office
☐ Commercial ☐ Historic ☐ Residential
☐ Emer. Services ☐ Industrial ☑ School

Number of Persons
☐ 0-10 ☐ 11-100
☑ 101-1000 ☐ 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

**Falling Hazard**

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding
Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | ☑ 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | ☑ -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | 3.2 | | | | | | | | | | | |

Comments:
See Swanson School for images

Detailed Evaluation Required ☐

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form — HIGH Seismicity

Address:31706 Parks Highway
Zip: 99688
Other Identifiers:
No Stories: 2
Year Built: 1961
Screener: 2
Date: None
Total Floor Area (sq. ft.): 34757
Building Name: **Willow 1961**
Use: None

No Sketch

No Photograph

**Occupancy**

| | | |
|---|---|---|
| ☐ Assembly | ☐ Govt | ☐ Office |
| ☐ Commercial | ☐ Historic | ☐ Residential |
| ☐ Emer. Services | ☐ Industrial | ☑ School |

Number of Persons: ☐ 0-10 ☐ 11-100 ☑ 101-1000 ☐ 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

**Falling Hazard**

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding

Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.4 | 3.8 | 2.8 | 3.0 | 3.2 | 2.8 | 1.9 | 2.5 | 2.8 | 1.5 | 2.6 | 2.4 | 2.8 | 2.8 | 1.7 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | ☑ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | ☑ -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | 2.5 | | | | | | | | | | | | | |

Comments:
See Entry for Willow School

Detailed Evaluation Required ☐

* = Estimated, subjective or unreliable data
DNK - Do Not Know

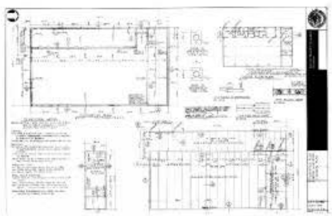
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form — HIGH Seismicity



Address:31706 Parks Highway
Zip: 99688
Other Identifiers:
No Stories: 2
Year Built: 1976
Screener: 1
Date: None
Total Floor Area (sq. ft.): 34757
Building Name: **Willow 1976**
Use: None


**Occupancy**: Assembly; Govt; Office; Commercial; Historic; Residential; Emer. Services; Industrial; School [✓]

**Number of Persons**: 0-10; 11-100; 101-1000 [✓]; 1000+

**Soil Type**: A Hard Rock; B Avg. Rock; C Dense Soil; D Stiff Soil [✓]; E Soft Soil; F Poor Soil

**Falling Hazard**: Unreinforced Chimneys; Parapets; Cladding; Other:

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.5 | 3.9 | 2.9 | 3.1 | 3.3 | 2.9 | 2.2 | 2.5 | 2.9 | 1.8 | 2.7 | 2.5 | 2.9 | 2.9 | 2.0 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 [✓] | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | | | | | | | | | | 2.3 | | |

Comments:

Detailed Evaluation Required

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

http://192.168.254.253:8000/Rover/worksheet/printable_site/6 1/1

2/20/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity

Address:31706 Parks Highway
Zip: 99688
Other Identifiers:
No Stories: 2
Year Built: 1987
Screener: 1
Date: None
Total Floor Area (sq. ft.): 34757
Building Name: **Willow 1987**
Use: None

No Sketch

No Photograph

### Occupancy

- [ ] Assembly
- [ ] Govt
- [ ] Office
- [ ] Commercial
- [ ] Historic
- [ ] Residential
- [ ] Emer. Services
- [ ] Industrial
- [x] School

Number of Persons

- [ ] 0-10
- [ ] 11-100
- [x] 101-1000
- [ ] 1000+

### Soil Type

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

### Falling Hazard

- [ ] Unreinforced Chimneys
- [ ] Parapets
- [ ] Cladding

Other:

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.4 | 3.8 | 2.8 | 3.0 | 3.2 | 2.8 | 1.9 | 2.5 | 2.8 | 1.5 | 2.6 | 2.4 | 2.8 | 2.8 | 1.7 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | ☑ -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | ☑ -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | | | | | | | | | | 1.7 | | |

Comments:
See Willow 1961 for Photos

Detailed Evaluation Required ☑

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

http://192.168.254.253:8000/Rover/worksheet/printable_site/9 1/1

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form — HIGH Seismicity

No Sketch

Address:701 E Bogard Rd
Zip: 99654
Other Identifiers:
No Stories: 2
Year Built: 1974
Screener: 1
Date: None
Total Floor Area (sq. ft.): 212206
Building Name: **Wasilla High 1974**
Use: None


**Occupancy**

- [ ] Assembly
- [ ] Govt
- [ ] Office
- [ ] Commercial
- [ ] Historic
- [ ] Residential
- [ ] Emer. Services
- [ ] Industrial
- [x] School

Number of Persons

- [ ] 0-10
- [ ] 11-100
- [ ] 101-1000
- [x] 1000+

**Soil Type**

- [ ] A Hard Rock
- [ ] B Avg. Rock
- [ ] C Dense Soil
- [x] D Stiff Soil
- [ ] E Soft Soil
- [ ] F Poor Soil

**Falling Hazard**

- [ ] Unreinforced Chimneys
- [ ] Parapets
- [ ] Cladding

Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | | | | | | | | | | 1.6 | | |

Comments:
Some conc shear walls are not connected to diaph with collectors

Detailed Evaluation Required
- [x]

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

3/16/2015 FEMA 154

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form MODERATE Seismicity

No Sketch

Address:701 E Bogard Rd
Zip: 99654
Other Identifiers:
No Stories: 2
Year Built: 1979
Screener: 2
Date: None
Total Floor Area (sq. ft.): 212206
Building Name: **Wasilla High 1979, West Classrooms**
Use: None


**Occupancy**

Assembly · Govt · Office · Commercial · Historic · Residential · Emer. Services · Industrial · School

Number of Persons: 0-10 · 11-100 · 101-1000 · 1000+

**Soil Type**

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| Hard Rock | Avg. Rock | Dense Soil | Stiff Soil | Soft Soil | Poor Soil |

**Falling Hazard**

Unreinforced Chimneys · Parapets · Cladding

Other:

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 5.2 | 4.8 | 3.6 | 3.6 | 3.8 | 3.6 | 3.6 | 3.0 | 3.6 | 3.2 | 3.2 | 3.2 | 3.6 | 3.4 | 3.4 |
| Mid Rise(4-7 stories) | NA | NA | 0.4 | 0.4 | NA | 0.4 | 0.4 | 0.2 | 0.4 | 0.2 | NA | 0.4 | 0.4 | 0.4 | -0.4 |
| High Rise(>7 stories) | NA | NA | 1.4 | 1.4 | NA | 1.4 | 0.8 | 0.5 | 0.8 | 0.4 | NA | 0.6 | NA | 0.6 | NA |
| Vertical Irregularity | -3.5 | -3.0 | -2.0 | -2.0 | NA | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | NA | -1.5 | -2.0 | -1.5 | -1.5 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | ✓ -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -0.2 | -0.4 | -0.4 | -0.4 | -0.4 | -0.2 | -1.0 | -0.4 | -1.0 | -0.2 | -0.4 | -0.4 | -0.4 | -0.4 |
| Post-Benchmark | 1.6 | 1.6 | 1.4 | 1.4 | NA | 1.2 | NA | 1.2 | 1.6 | NA | 1.8 | NA | 2.0 | 1.8 | NA |
| Soil Type C | -0.2 | -0.8 | -0.6 | -0.8 | -0.6 | -0.8 | -0.8 | -0.6 | -0.8 | -0.6 | -0.6 | -0.6 | -0.8 | -0.6 | -0.4 |
| Soil Type D | -0.8 | -1.2 | -1.0 | ✓ -1.2 | -1.0 | -1.2 | -1.2 | -1.0 | -1.2 | -1.0 | -1.0 | -1.2 | -1.2 | -1.2 | -0.8 |
| Soil Type E | -1.2 | -1.8 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 | -1.6 |
| Final Scores | | | | 1.9 | | | | | | | | | | | |

Comments:

Detailed Evaluation Required ✓

* = Estimated, subjective or unreliable data
DNK - Do Not Know
BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal
MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm
SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

http://192.168.254.253:8000/Rover/worksheet/printable_site/11 1/1

# Rapid Visual Screening of Buildings for Potential Seismic Risk

## FEMA-154 Data Collection Form — HIGH Seismicity

No Sketch

Address:701 E Bogard Rd
Zip: 99654
Other Identifiers:
No Stories: 1
Year Built: 1979
Screener: 1
Date: None
Total Floor Area (sq. ft.): 400
Building Name: Wasilla High 1979, Entry Addn
Use: None


**Occupancy**

| | | |
|---|---|---|
| ☐ Assembly | ☐ Govt | ☐ Office |
| ☐ Commercial | ☐ Historic | ☐ Residential |
| ☐ Emer. Services | ☐ Industrial | ☑ School |

Number of Persons: ☐ 0-10 ☐ 11-100 ☐ 101-1000 ☑ 1000+

**Soil Type**

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | ☐ | ☐ |

**Falling Hazard**

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding

Other: Inadequately tied to 1974 stru

**Basic Scores, Modifiers, and Final Score, S**

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | ☑ -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | ☑ -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | | | | | | | | | | 1.6 | | |

Comments:

Detailed Evaluation Required ☑

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
TU = Tilt Up
URM INF = Unreinforced masaonry infill

# Rapid Visual Screening of Buildings for Potential Seismic Risk
## FEMA-154 Data Collection Form HIGH Seismicity

Address:701 E Bogard Rd
Zip: 99654
Other Identifiers:
No Stories: 2
Year Built: 1979
Screener: 1
Date: None
Total Floor Area (sq. ft.): 212206
Building Name: **Wasilla High 1979, East Addn with Pool**
Use: None

No Sketch


### Occupancy

| | | |
|---|---|---|
| Assembly | Govt | Office |
| Commercial | Historic | Residential |
| Emer. Services | Industrial | ✓ School |

Number of Persons

| | |
|---|---|
| 0-10 | 11-100 |
| 101-1000 | ✓ 1000+ |

### Soil Type

| A Hard Rock | B Avg. Rock | C Dense Soil | D Stiff Soil | E Soft Soil | F Poor Soil |
|---|---|---|---|---|---|
| | | | ✓ | | |

### Falling Hazard

Unreinforced Chimneys | Parapets | Cladding

Other:

### Basic Scores, Modifiers, and Final Score, S

| Building Type | W1 | W2 | S1 (MRF) | S2 (BR) | S3 (LM) | S4 (RC SW) | S5 (URM INF) | C1 (MRF) | C2 (SW) | C3 (URM INF) | PC1 (TU) | PC2 | RM1 (FD) | RM2 (RD) | URM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Score | 4.3 | 3.7 | 2.7 | 2.9 | 3.1 | 2.7 | 1.8 | 2.4 | 2.7 | 1.4 | 2.5 | 2.3 | 2.7 | 2.7 | 1.6 |
| Mid Rise(4-7 stories) | NA | NA | 0.2 | 0.4 | NA | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | NA | 0.2 | 0.4 | 0.4 | 0.0 |
| High Rise(>7 stories) | NA | NA | 0.6 | 0.8 | NA | 0.8 | 0.8 | 0.6 | 0.8 | 0.3 | NA | 0.4 | NA | 0.6 | NA |
| Vertical Irregularity | -2.5 | -2.0 | -1.0 | -1.5 | NA | -1.0 | -1.0 | -1.5 | -1.0 | -1.0 | NA | ✓ -1.0 | -1.0 | -1.0 | -1.0 |
| Plan irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | ✓ -0.5 | -0.5 | -0.5 | -0.5 |
| Pre-Code | 0.0 | -1.0 | -1.0 | -0.8 | -0.6 | -0.8 | -0.2 | -1.2 | -1.0 | -0.2 | -0.8 | -0.8 | -1.0 | -0.8 | -0.2 |
| Post-Benchmark | 2.4 | 2.4 | 1.4 | 1.4 | NA | 1.6 | NA | 1.4 | 2.4 | NA | 2.4 | NA | 2.8 | 2.6 | NA |
| Soil Type C | 0.0 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 | -0.4 |
| Soil Type D | 0.0 | -0.8 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.6 | -0.6 | -0.4 | -0.6 | ✓ -0.6 | -0.6 | -0.6 | -0.6 |
| Soil Type E | 0.0 | -0.8 | -1.2 | -1.2 | -1.0 | -1.2 | -0.8 | -1.2 | -0.8 | -0.8 | -0.4 | -1.2 | -0.4 | -0.6 | -0.6 |
| Final Scores | | | | | | | | | | | | 0.3 | | | |

Comments:

Detailed Evaluation Required ✓

* = Estimated, subjective or unreliable data
DNK - Do Not Know

BR = Braced Frame
FD = Flexible Diaphragm
LM = Light Metal

MRF = Moment-resisting frame
RC - Reinforced concrete
RD = Rigid diaphragm

SW = Shear Wall
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# Earthquake Danger to Alaska's Students and Schools
# Appendix B

## BBFM's Experience with ROVER

BBFM Engineers spent a significant amount of time setting up the ROVER server on our computer. We had trouble finding the user manual—it turns out that it's on the web site under "documentation," but that site's interconnectivity could be substantially improved so it's much more expedient to find things. Additionally, some of the web site contains outdated information, such as the information on ROVER being a "thick client" (where the mobile device stores the information until it is synchronized with the server) and the server being "optional."

Because we have a firewall protecting our company's software, we placed the server on a computer outside our firewall but still connected to our same internet router. Our desktop computers could access the server using its IP address, but that same IP address would not work for mobile devices. Ultimately we determined that this IP address was internal to our network and is not the one seen from outside. Once we determined the IP address as seen from outside our office, we were able to use our mobile devices to connect to the ROVER server. I noticed that in the "View Worksheet" screen, all three falling hazards become indicated if the user checks only the chimneys. Conversely, if the user checks parapets or cladding but not chimneys, no falling hazards are indicated in the "View Worksheet" screen. I again notified the software developer, and I was told they were able to duplicate the problem and that they were working on it.

While we were trying to set up the server, we also explored using an app named Rover ATC 2.0, but ultimately we did not use this. It had a number of glitches in it that prevented it from being useful. Initially, its display was so small as to be unreadable, and the text could not be enlarged. When I contacted the software developer, they were able to duplicate the error and ultimately fix it.

Once the server was installed and accessible, we made use of the structural drawings supplied to us. We entered all the data we could from our desktop: building type, number of stories, vertical and plan irregularities, soil type, and whether the building was pre-code or post-benchmark. We then visited the elementary school sites in a single day, taking photographs and noting items that weren't clear in the drawings. Several of these structures would have been indicated as requiring further study if we had truly conducted a "sidewalk survey" without consulting the drawings.

While we could have uploaded photographs directly to the ROVER server from our mobile devices, we chose to transfer them to our desktop computers later, and from there to the server, because that would be faster and require less attention while onsite.

With respect to photographs, ROVER could use some work. Each photograph has to be uploaded individually, with a series of several clicks. It would be a tremendous improvement if ROVER would allow many photographs to be selected for upload at one time. It was taking at least 30 seconds to upload a single photograph, so a site with ten or twenty photographs ends up taking far too long for a simple file transfer process. Further, we noticed our ROVER server slowing down as we uploaded photos for more and more schools. Where initially upload required about 30 seconds, toward the end, upload required more than a minute. It appears the server does not accommodate large numbers of photographs well.

It should be noted that many of the photographs we uploaded were jpeg files of the structural design drawings. We believe these are quite important to have in the database. After an earthquake, it can help inspectors tremendously to know crucial details about the structural system, such as where braces or moment frames are, etc. Yet the only way ROVER allows design drawings to be uploaded is in jpeg format. This is a great weakness in the program. Design drawings are very commonly saved in multi-page pdf format, so ROVER should accommodate that file type. Instead, we saved each page of the design drawings into jpeg format and uploaded them to the database as photographs. Needless to say, this was cumbersome and time-consuming for us, and it will be less convenient for others referring to the database in the future.

Another simple improvement to ROVER would be for it to indicate the benchmark year for particular system types in the "post-benchmark" row. Without that, the user needs to keep that list on hand, which may not be convenient in the field.

Finally, we note that ROVER is based on the second edition of FEMA P-154. The third edition is now available, and it has some significant improvements to the scoring procedure. We assume ROVER will be updated to follow the third edition; it is important that, as servers are updated, their structures' scores will be revised automatically to correspond to the third edition's process. Some characteristics, such as pounding, are covered by the third edition but not the second, so to keep the database current would still require some additional manpower.

Now that we have set up our ROVER server, we have agreed to maintain it for the foreseeable future, both for the buildings described in this report and for buildings that may be evaluated in the future.

On the whole, we believe that this rapid visual screening program can be very helpful in improving public safety in the context of major earthquakes, and we hope this pilot project is followed by similar studies statewide.