

UAA

Earthquake

Readiness

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UNIVERSITY
of ALASKA
ANCHORAGE



About UAA Buildings

- University of Alaska established in 1917 in Fairbanks
- UAA is even newer - oldest buildings date from 1970's and many were designed to be civil defense shelters
- Cold-War signage still a quaint "curio" in Ron Swartz's office
- UAA's older buildings are relatively low profile, 2-story concrete structures
- UAA's newer buildings are steel-frame construction
- UAA's newer buildings are 5 stories or less, including the mechanical penthouses.

Emerging EQ design-ability

- Past decades (since I graduated) – explosion in growth of seismic engineering design
- EQ modeling previously only available for high rise and mega structures
- Personal computer industry and associated design software changed EQ design practice
- Dynamic modeling now available for even small to medium sized structures
- Even individual floor levels and structural elements are examined with relative ease
- As a result, modern buildings are built better

- March 27, 1964 Great Alaska Earthquake magnitude 9.2
- Damage extensive, largely due to previously unknown localized geophysical instabilities
- Subsequently, AK engineers and scientists have estimated:
 - where large earthquakes are most likely to originate
 - what probable levels of ground shaking are to be expected
 - where soil properties and landslide failure potentials are greatest
 - what risks exist in a given area



Shows areas of relative geological instability in Anchorage - **Red** indicates areas of highest damage from the '64 quake.

Note the location of the university (marked with a **red** circle). The soils beneath the campus are relatively stable.

Anchorage and EQ standards

- Anchorage development discouraged in particularly hazardous areas
- IBC building code Zone D (within which the Anchorage bowl falls) requires new buildings be designed to withstand intense ground shaking
- However, wind loading often dictates in lateral analysis (100-120 mph wind speeds – hurricane force)
- As a result, Anchorage often builds beyond the “minimum” earthquake standards
- UAA buildings are expected to be an important part of Anchorage’s earthquake recovery assets (shelter, triage, medical)

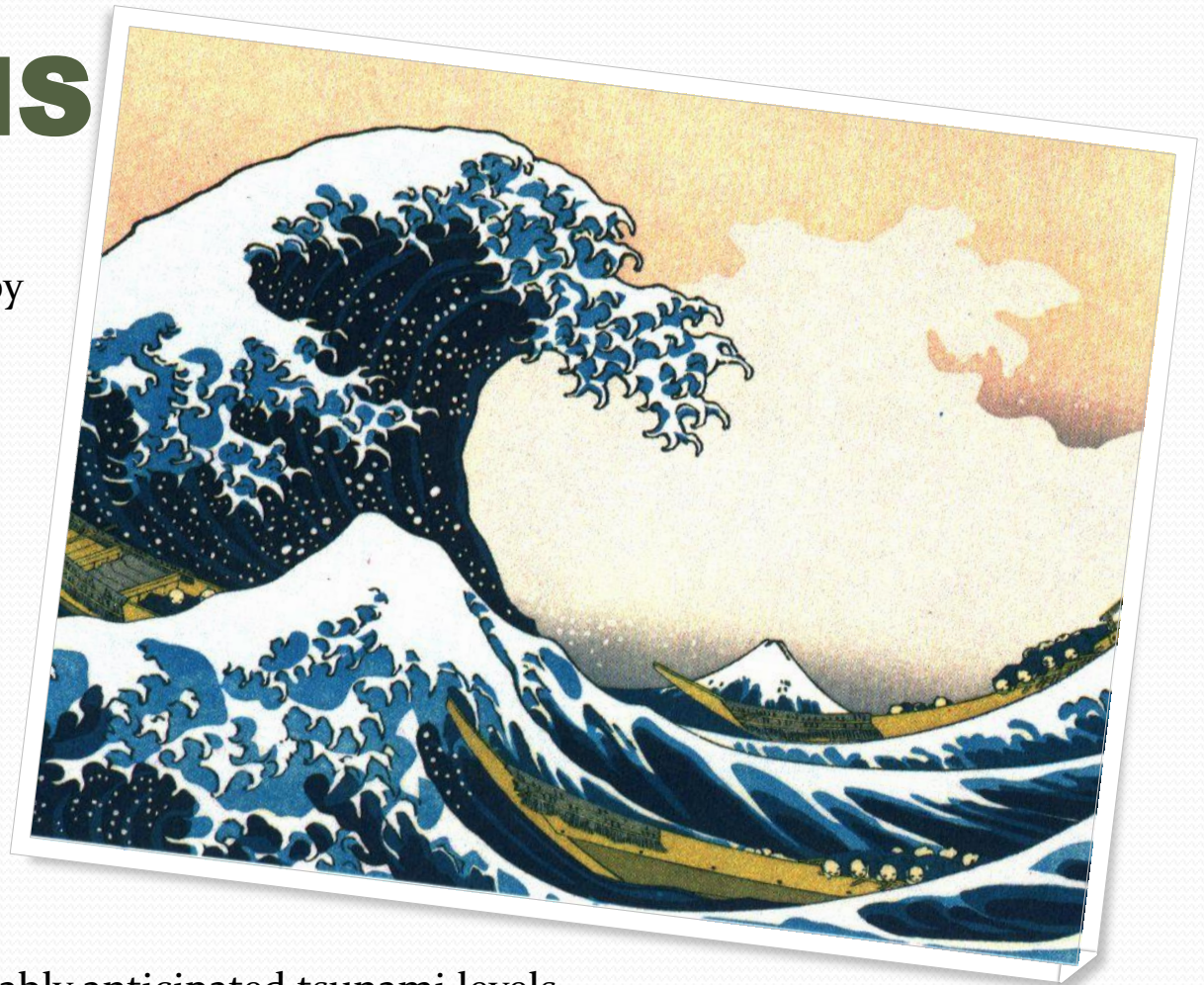
TSUNAMIS

Tsunamis are often caused by earthquakes, as was the case in 1964.

UAA is roughly at 220 feet above sea level, well above the '64 tsunamis.

220 foot tsunamis would be high enough to affect the entire Pacific Rim.

UAA is well above all reasonably anticipated tsunami levels.



Alaska EQ compared to Northridge, CA EQ

- Summer 2014 Anchorage bowl had a 6.8 earthquake
- Damage city-wide was limited to products falling from store shelves, bookcases toppling, and some dislodged ceiling tiles
- 1994 Northridge, CA earthquake, magnitude 6.7
- The quake resulted in at least 57 deaths, more than 9,000 injured, and cost \$20 billion in damage
- Doug experienced Northridge firsthand as a disaster responder for the State of CA
- California's Seismic Safety Commission said "comparatively low losses," relative to world-wide, as result of mitigation measures implemented in that area.
- Alaska builds and prepares for quakes in excess of the 6 to 7 range



UAA Emergency Operation Plan (EOP)

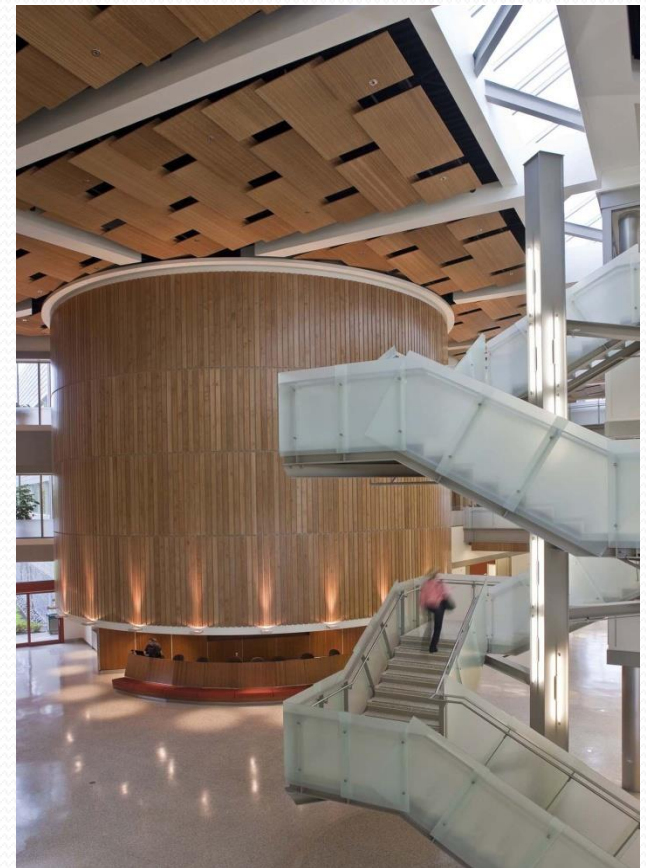
(currently found on the University Police Department website)

Introducing

Mr. Ron Swartz, UAA Emergency Manager

Building Emergency Plan (BEP)

In addition to the EOP, UAA has a response plan specific to each individual building as well.



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Mr. Markussen moved to Alaska at the age of 3 and experiencing the March 27th 1964 Great Alaska Earthquake while in first grade.

Doug is also a proud 1986 alumnus of UAA's School of Engineering.

In addition to Alaska, he was also a registered professional engineer in California for many years. Aside from working in various private engineering firms, for 9 years Doug performed structural and regulatory plan checking for the County of San Diego's Building Department, ensuring construction compliance with the Uniform Building Code (now known as the International Building Code). Additionally, he served for 11 years as the Enforcement Engineer for the County, encompassing grading, drainage, mining, reclamation, flood control, and zoning. During his time in California, Doug served as a State approved CALBO Disaster Responder and took part in the assessment of damage following the 1994 Northridge Earthquake and numerous SoCal firestorms.

In the course of his career, Doug performed numerous structural designs and is very familiar with dynamic lateral loading and uplift, including earthquake and wind. Doug is also familiar with geology and ground stability. Doug brings his expertise to UAA, with a thorough understanding of physical engineering and, in particular, earthquakes in the Anchorage area and specifically in the area occupied by the UAA main campus.

Safety is Everybody's Business

UAA Environmental Health & Safety, Risk Management Support and Emergency Management

