

Final Project Summary — PEER Lifelines Program

Project Title—ID Number	<i>SMA Site Characterization in Taiwan-SASW—2A02c</i>		
Start/End Dates	7/1/02 – 5/31/04	Budget/ Funding Source	\$108,092 / Caltrans
Project Leader (boldface) and Other Team Members	Stokoe/Rathje (UT at Austin)		

1. Project goals and objectives

Apply the Spectral-Analysis-of-Surface-Waves (SASW) Method to determine the shear wave velocity profiles of selected strong-motion recording (SMR) sites in Imperial Valley and Los Angeles, CA and use the results to determine classification of these sites in terms of the shear wave velocity in the top 30 m ($V_{s,30}$) and the upper portion of the V_s profiles to evaluate of their liquefaction potential.

2. Benefits of the results of this project to develop technologies and protocols to mitigate the vulnerability of electric systems and other lifelines to damage directly and indirectly caused by earthquakes. Also, benefits to develop assessment techniques to evaluate damage to electric systems caused by earthquakes and to assess fiscal impacts due to the loss of electric service to the community.

The SASW method can be used in siting facilities for electric systems, because $V_{s,30}$ obtained from the SASW method is used by engineers in estimating the earthquake site response and the upper portion of the V_s profiles can be used in liquefaction evaluations.

3. Brief description of the accomplishments of the project

In total, 42 shear wave velocity profiles (26 from Univ. of Texas at Austin and 16 from National Cheng Kung University) of the SMR sites in Taiwan were determined. Also, the site classification of each site was determined.

4. Describe any instances where you are aware that your results have been used in industry

The shear wave velocity profile reduced from the SASW method can be applied to determine earthquake site response/classification, liquefaction evaluations, landfill/soil compaction control, and pavement quality evaluation.

5. Methodology employed

Spectral-Analysis-of-Surface-Waves (SASW) Method is a non-intrusive seismic method of profiling geotechnical sites.

6. Other related work conducted within and/or outside PEER

Outside PEER: SASW testing in the Seattle, Washington area, at several landfills in the San Francisco area, and at the Yucca Mountain, Nevada, test site.

7. Recommendations for the future work: what do you think should be done next?

Perform SASW testing with a source which can generate more energy to explore deeper soil profiles at some sites which already have deeper V_s data obtained from other intrusive methods to demonstrate the accuracy of the SASW method for future deeper profiling.

8. Author(s), Title, and Date for the final report for this project

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Title: SMA Site Characterization in Taiwan-SASW

Date: August 31, 2004

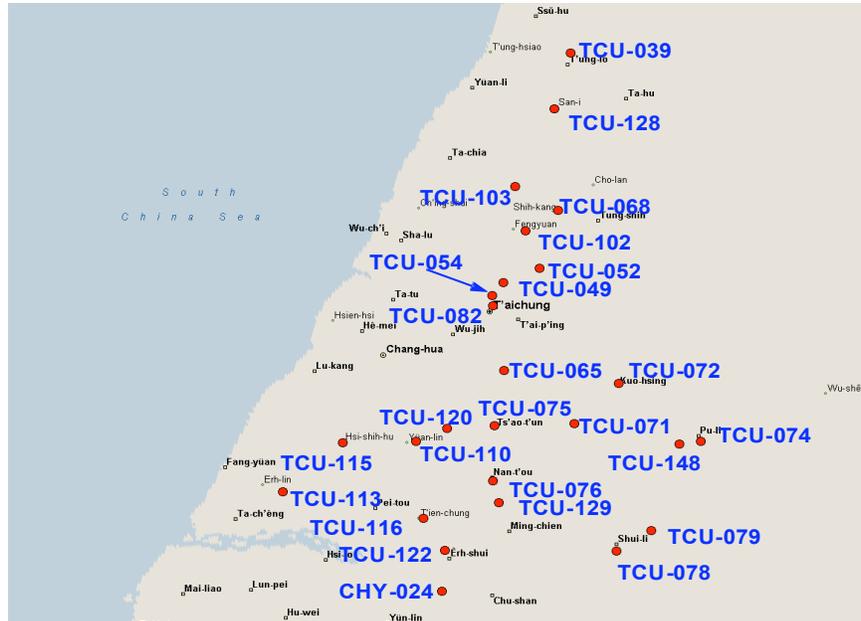


Figure 1. Map of Approximate Locations of 26 SMR Stations in Taiwan where SASW Seismic Tests were Performed by the University of Texas at Austin

Table 1. $V_{s,30}$ Values from 26 Sites and Site Classifications 26 SMR Stations in Taiwan where SASW Seismic Tests were Performed by the Univ. of Texas at Austin

No.	Site Name	Station No.	$V_{s,30}$ (fps)	Site Classification
1	Lin - Chong Elementary School	CHY-024	1400	C
2	Ton - Lo Elementary School	TCU-039	1810	C
3	Cheou - Shio Elementary School	TCU-049	1490	C
4	Wu - Fon Elementary School	TCU-065	800	D
5	Si - Kon Elementary School	TCU-068	1660	C
6	Suan - Don Elementary School	TCU-071	1930	C
7	Kuo - Sing Elementary School	TCU-072	1350	C
8	Nan - Kon Elementary School	TCU-074	1370	C
9	Chiou - Tun Elementary School	TCU-075	1480	C
10	Nan - To Elementary School	TCU-076	1750	C
11	Shai - Li Elementary School	TCU-078	1540	C
12	Tor - Se Elementary School	TCU-079	1390	C
13	Fon - Ton High School	TCU-102	1770	C
14	Nai - Pu Elementary School	TCU-103	2060	C
15	Yuan - Lin Elementary School	TCU-110	700	D
16	Sin - Hua Elementary School	TCU-113	780	D
17	Si - Hu Elementary School	TCU-115	750	D
18	Ten - Chong High School	TCU-116	1250	C
19	Ton - Ang Elementary School	TCU-120	1360	C
20	A - Sua Elementary School	TCU-122	1560	C
21	Cheng - Jung Elementary School	TCU-128	1720	C
22	Sin - Jai Elementary School	TCU-129	2180	C
23	Kung - Chung Elementary School	TCU-052	1290	C
24	Sin - San Elementary School	TCU-054	1600	C
25	Tai - Chung Weather Station	TCU-082	1310	C
26	Chi - Nan University	TCU-148	1390	C