



VACC Recent Key Projects: Fab Noise and Vibration Design Structural Vibration Consulting Samsung Austin Semiconductor Fab A2, Austin, Texas

Owner
Samsung Austin Semiconductor

Completion
2005

Work Scopes
Structural Vibration Design
Mechanical Vibration Design
Noise Design
Testing Services

Architect/Engineer
Graeber, Simmons & Cowan
Samwoo Arch/Eng
Paul-Koehler Brown
Kinetics
Baker-Aicklen

Contractor
Hensel Phelps

Total Building Area
Approx. 110,000 sq. ft.

Clean Room Area
Confidential

Clean Room Class
Class 1, 10, 100



Vibro-Acoustic Consultants was asked to provide structural/mechanical vibration design and testing services for the construction of a DRAM semiconductor fab for Samsung in Texas.

As with all semiconductor wafer fabs, the A2 facility required **vibration and noise design** for maximum yield performance.

The facility incorporates a one-level subfab with a bay-and-chase cleanroom configuration. Functional areas for photolithography are separated from other activities, with multiple floor systems and bay sizes serving different areas. Due to the site soils condition (expansive taylor clay), 5' deep crawl space and deep piles were used.

The structure is unique in that the lateral system is composed of a combination of shearwalls and diagonal braces. In addition, two different floor systems at the process level were utilized within one monolithic structure. The monolithic structure simplified the lateral system and provided significant cost savings in comparison with independent structures.

Our design input included **vibration and noise consulting** at the Concept Design phase, continuing through Design Development and Construction Administration. Testing services included initial greenfield site ambient testing, *in-situ* structural evaluation, and as-built final evaluation.

Samsung Austin Semiconductor is a US-based company owned by the Korean manufacturing giant. The Austin campus houses the only fab facilities outside of Korea, producing DRAM chips. This was the second expansion to Samsung's facilities in Austin, part of a 3-year, US\$500million investment campaign. This part of the expansion added about 50,000 wafer starts per month on 100nm and 80nm manufacturing processes.