

Point-fixed Seismic Fin Glass System

Design Criteria

Design Criteria is based on the California Building Code (CBC). The code requires that the cladding system be designed to withstand a maximum inelastic drift of 2 -2 ½ % of the height of the building. The code also requires that the cladding system for glass panels and glass panel joints accommodate movements of the structure based upon the elastic and inelastic displacement of the support structure.

CBC states that calculated story drifts using ΔM shall not exceed 0.025 times the story height for structures having a fundamental period of less than 0.7 second. For structures having a fundamental period of 0.7 second or greater, the calculated story drift shall not exceed 0.020 times the story height. The maximum inelastic response displacement, D_m shall be computed as follows:

$$D_m = 0.7 R D_s$$

Where, R denotes the numerical coefficient representative of the inert over strength and global ductility of lateral force-resisting systems. D_s denotes Elastic Response Displacement

Current Code Philosophy and Implementation

The goal of the California Building Code is to Prevent

- Non-structural damage in frequent, minor ground shaking
- Structural damage and minimize non-structural damage in occasional moderate ground shaking
- Collapse or serious damage in rare major ground shaking

Above all, the code aims to preserve life safety under all but the worst cases. The elastic level seismic drift requirements correspond to demand due to frequent, minor ground motion. The inelastic seismic drift requirements establish a performance level corresponding to stronger and less frequent events.

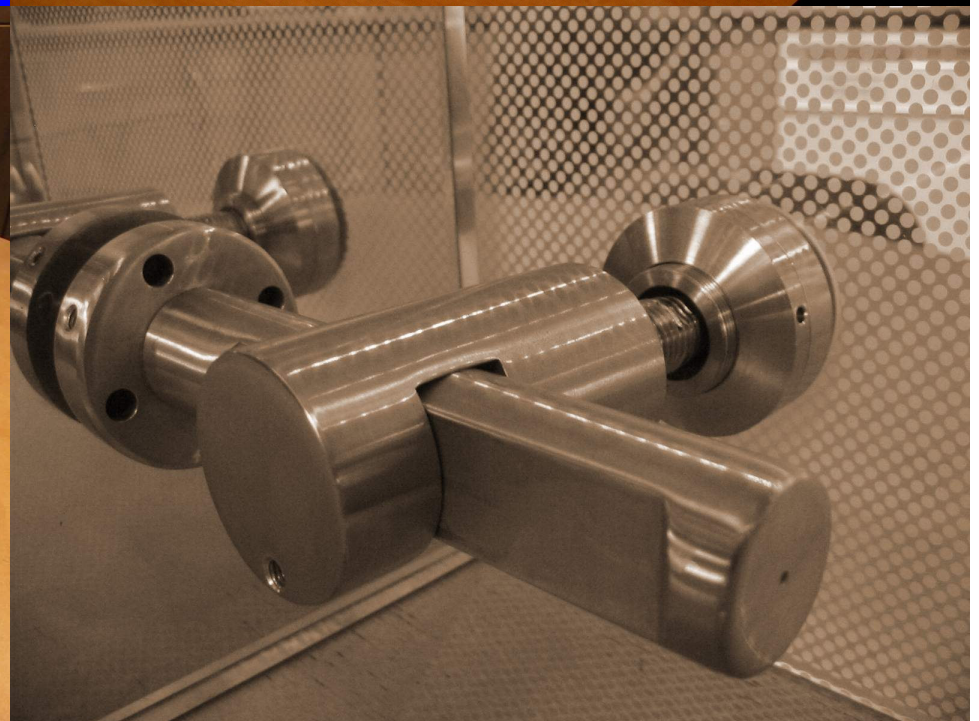
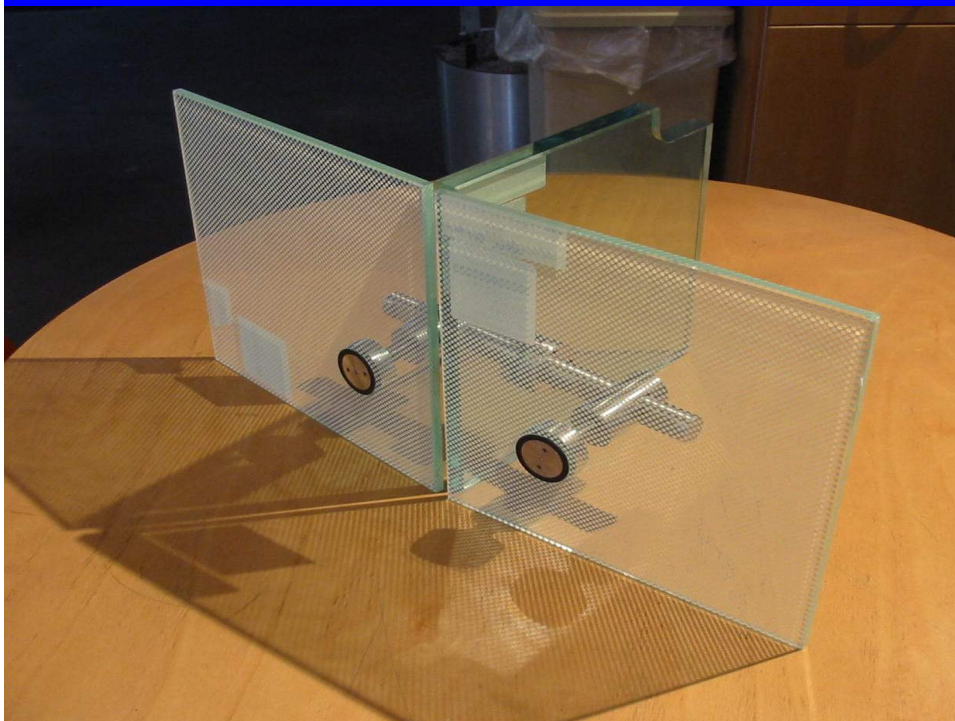
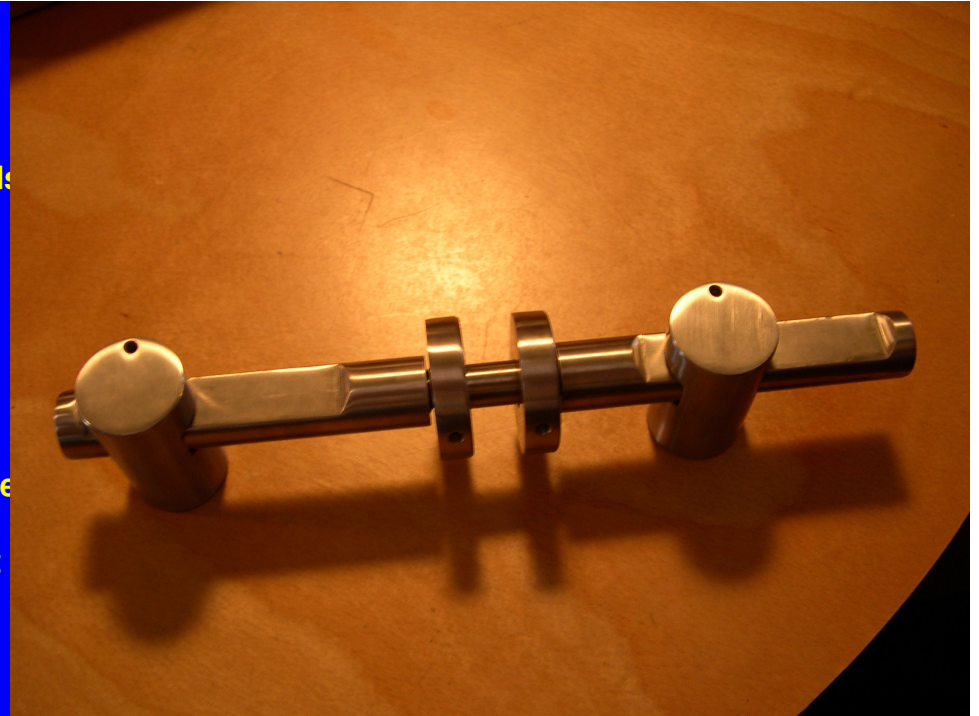
The implementation of code philosophy in the design of cladding systems presents some issues particularly, the code's view that exterior panel and panel joints must accommodate movements of the support building structure based upon D_m of the support building structure. Note here that the code only states "accommodate" and it is left to the design team to use an appropriate definition of accommodate questions and concerns remain in the interpretation of accommodate and the specific performance required of the cladding system.

Code Limitations

The code is not necessarily an accurate predictor of the forces and deformations that structures will experience during earthquakes. In general, the inelastic deformation limit of $0.025 \cdot h$ is considered to be a conservatively large displacement.

Overview of the Structural System

The function of this system is to isolate the glass from the primary building structure for in-plane deformations and loads while supporting it vertically and for out of plane loads. The system components include the slotted spiders, ball and socket glass bolts, glass, and silicone sealant. The slotted spiders are the central components of the system (Figure 1). Their purpose is to allow the glass to accommodate large interstory drift demand by horizontal translation. The size of the slot is based on the maximum panel height and the UBC maximum permissible inelastic drift limit of the structure under consideration, either $0.020 \cdot h$ or $0.025 \cdot h$. This allows the system to be used in any building for which the inelastic drift has not been determined by analysis.



THANK YOU