Technical Review Board
Memorandum

Date: May 1, 2016 (approved by TRBSC)

Issue: **Notice on Use of Soil Anchors (Mico-Piles)**
to be added to commentary in SRG2, Volume 2, Part C, Chapter 14
C14.1(2) Soil Anchors
(Part of the Seismic Mitigation Program for Schools)

Discussion:

How are soil anchors/mini-piles dealt within the context of SRG2?

Recommendation:

Soil Anchors can be employed to increase overturning resistance, such that rocking is no longer the governing mode for an LDRS. Refer to Chapter 5. The over-strength capacity of overturning resistance at the base of an LDRS (accounting for the resistance of the soil anchors) must be greater than the over-strength capacity of the LDRS prototype above. Use Ro=1 for the calculation of over-strength capacity for overturning using soil anchors.

For buildings with very low drift tolerances, foundation rotation due to soil anchor elongation, combined with soil compression (and possibly soil anchor compression) at the opposite end of the foundation, can be problematic. Foundation rotation directly affects storey drift, and *must* be accounted for in combination with the storey drift of the LDRS itself (assuming a fixed base), when evaluating the VLS components and/or lateral resistance contributions of other LDRS.

Foundation rotation is especially critical when the following factors apply to the retrofit design:

- High capacity soil anchors in weak soil (i.e. very long anchors)
- Long unbonded length of soil anchors, due to geotechnical provisions
- Relatively short pile caps where the distance between coupled anchors is small
- Short non-ductile columns or very low drift tolerant VLS
- Very low drift LDRS (other than those on foundations with soil anchors) that are intended to contribute to the block lateral resistance

Consult with your geotechnical engineer to estimate soil anchor elongation, soil compression, and resulting foundation rotation.

It is noted that the sliding resistance must be checked to ensure no sliding occurs for a foundation with soil anchors (i.e. the friction capacity at the foundation/soil interface is larger than the shear associated with the over-strength capacity of the LDRS). If diagonal (i.e. battered) soil anchors are required for sliding resistance, then lateral component of their extension (or compression) must also be included in determining the total storey drift at the location of the LDRS with the soil-anchored foundation.