

Technical Memorandum

Subject: Interface Shear and Lifting Loops for Unit Alignment

Technical Information:

Exposed steel lifting loops are provided on most Stone Strong precast modular retaining wall units. These lifting loops serve a dual purpose; besides being integral for handling the units, the lifting loops also serve an alignment function. Most units are provided with a recess at the bottom of the unit that mates with the lifting loop on the unit below to align the unit for the specified batter. The recesses can be adjusted at casting to provide for either a vertical face or a battered face at 6.3 degrees (4 inches of batter per 36-inch tall course).

It is important to recognize that the alignment function is provided for productivity and convenience during installation but is not required for stability of the retaining wall system. There are many instances where the lifting loops and recesses are offset at installation. This includes the transition from 6SF units (6-44 and 6-28) to 24SF units (24-44, 24-ME, 24-62, 24-86, and D150). This also can occur when installing battered units around a radius, which results in a different arc length for each course potentially causing the loop and recess to be offset. In addition, there are cases where the lifting loops may be cut and bent or removed altogether to allow local adjustment of the wall batter.

To assess cases where the mechanical alignment is not present, interface shear testing was performed with the lifting loops removed (see [Interaction Report with 24SF Units and Synteen Geogrids](#), September 2004 and [Interaction Report with 6SF Units and Synteen Geogrids](#), May 2005). The lifting loops were removed prior to these tests, and the shear parameters were based solely on unit friction and aggregate interlock through the large block voids. Based on these tests, the following interface shear parameters are recommended for internal stability analysis of gravity and MSE walls:

Unit Interface Shear Strengths:	Unit to Unit (no grid) 24-44 and 6-44 units	Synteen SF110 with 24-44 units	Synteen SF110 with 6-44 Units	Synteen SF55 with 6-44 and 24-44 units
Min Shear Capacity (lb/ft)	362	362	362	362
Friction Angle (deg)	35.2	19.2	20.2	22.4
Max Shear Capacity (lb/ft)	19,000	11,000	7,038	10,115

These design shear parameters do not rely on the lifting loops. Therefore, installations where the lifting loops are removed, adjusted, or are offset from the alignment recess are not a concern and should not affect the integrity of the retaining wall installation.