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Technical Memorandum

Subject: Steel reinforcement in Stone Strong precast modular wall units

Technical Information:

Stone Strong 24SF and 6SF units are designed to be unreinforced in typical gravity wall applications. The thickness of the webs and flanges provide structural integrity for normal gravity wall applications with these units. All extended units (24-86, 24-62, and 24-ME) are required to be reinforced in all applications, and reinforcement is required in many MSE applications as shown in the accompanying tables.

Stone Strong Systems has investigated MSE retaining walls using 24SF units and have found some instances of cracking in the lower portion of tall walls. Our evaluation has determined that minor yielding in the foundation results in differential movement of the units in the lower course. This causes cracks to develop in one or more courses above the bottom course. This typically does not affect the structural integrity of the 24SF unit or the wall system, but can have an aesthetic impact. In taller walls, reinforcement is necessary to ensure the structural integrity of the units.

For MSE walls using Paraweb reinforcement, all units should be reinforced and heavy duty (HD) reinforcement should be used below prescribed heights based on the type of unit. Rebar is necessary in the back face of 24SF, 6SF, and 6-28 units as part of the Paraweb connector. Standard reinforcement in 24SF-Paraweb units will also include a steel mesh or rebar cage in the face and webs. For 24SF-HDParaweb units between 36 and 51 feet (11.0 to 15.5 m) below the top of wall, HD reinforcement should also include a steel mesh or rebar cage within the back face. For 6SF-HDParweb or 6-28-HDParaweb units between 12 and 51 feet (3.7 to 15.5 m) below the top of wall, HD reinforcement should include a mesh or rebar cage in the face and webs.

For MSE walls using geogrid reinforcement over 12 feet (3.7 m) in height and less than 30 feet (9.1 m) in height, internal reinforcement shall be utilized in all 24SF units below the top 12 feet (3.7 m) of the wall. A reinforcement cage consisting of steel mesh or rebar should be placed in the face and webs of 24SF-Reinforced units. Stone Strong recommends that project specific guidance be provided for geogrid reinforced MSE walls over approximately 30 feet (9.1 m).

Reinforcing details are provided in the Production Manual for 24SF-Reinforced, 24SF-Paraweb, 24SF-HDParaweb, 6SF-Paraweb, 6SF-HDParaweb, 6-28-Paraweb, 6-28-HDParaweb, 24-86, 24-62, and 24-ME units. Options are provided for both steel mesh and rebar options, where applicable. Stone Strong Systems recommends that designers indicate types of reinforced or HD reinforced blocks where required on shop drawings or installation drawings for MSE walls.

Gravity Wall Applications

Unit Type	All Heights
24SF	24SF
6SF	6SF
6-28	6-28
24-62	**24-62**
24-86	**24-86**
24-ME	**24-ME**

Paraweb MSE Applications

Unit Type	Depth Below Top of Wall		
	0-12 feet (0-3.7 m)	12-36 feet (3.7-11.0 m)	36-51 feet (11.0-15.5 m)
24SF	**24SF-P**	**24SF-P**	**24SF-HDP**
6SF	**6SF-P**	**6SF-HDP**	**6SF-HDP**
6-28	**6-28-P**	**6-28-HDP**	**6-28-HDP**
Note: If a gravity section is included at the top of the wall (hybrid applications), gravity units may follow the gravity application table			

Geogrid MSE Applications

Unit Type	Depth Below Top of Wall	
	0-12 feet (0-3.7 m)	12-30 feet (3.7-9.1 m) **
24SF	24SF	**24SF-R**
6SF	6SF	6SF
6-28	6-28	6-28
** Project specific guidance is recommended for geogrid reinforced MSE walls over 30 feet tall		

(In all tables, light shading indicates reinforced units, dark shading indicates HD reinforced units)