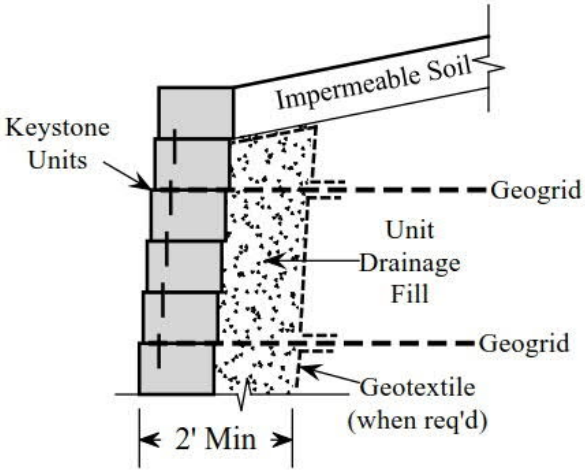
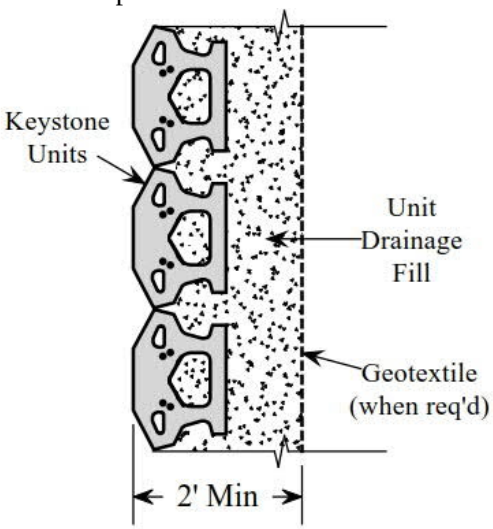
Unit Drainage Fill

Unit drainage fill is defined as a free draining aggregate material such as ASTM designation No. 57 or 67 stone which is small enough (1" minus clean material) to easily fill unit cores and the gaps between units while containing minimal fine material (sands and silts) that could pipe through wall joints from occasional water flow. Unit drainage fill can be used in conjunction with geotextile filter fabrics to provide positive filtration and soil retention, most commonly in areas where water flow is expected such as with detention basin and flood plain structures.



Unit Drainage Fill Section



Unit Drainage Fill Plan

Unit drainage fill provides significant technical benefit for modular wall performance and construction:

- Prevents the buildup of hydrostatic pressures near the wall face through a 2 foot deep porous drainage zone.
- Provides a non-frost susceptible zone within and directly behind the wall units.
- Provides a high friction and easily compacted material within and behind the wall units that enhances facing zone stability.
- The unit drainage fill placed within and between units improves inter-unit shear and geogrid connection strength for units with thru cores and tapered sides.

Unit fill drainage material is typically described as a 1/2" - 3/4" clean stone (1" minus or No. 57 stone are common). While many granular materials can be described as "free draining", the following gradation is recommended by Keystone based on experience:

Sieve	% passing
1"	100
3/4"	75 - 100
#4	0 - 10
#50	0 - 5

The intent of this specification is to limit the top size to 1" and restrict the sand and silt component to less than 10% to avoid migration of fines and for ease of placement and compaction in confined spaces.

Note: All Keystone Unit connection testing is performed with unit cores completely filled with unit drainage fill. Therefore, replicating this in the field is important to unsure the connection test data used in the design is consistent with the constructed structure. For this reason, Keystone recommends placing unit drainage fill after each consecutive course. If additional courses are placed prior to filling unit cores, it will be difficult to properly fill unit cores, especially when geogrid layers are present which will prevent core fill from entering the lower courses.