



KEYSTONE PLANTER UNIT



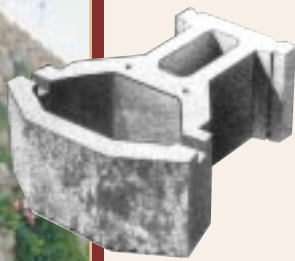
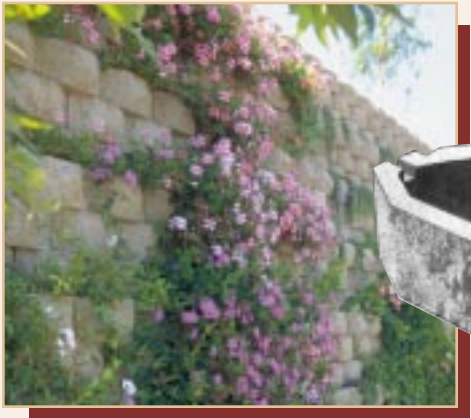
▲ LET YOUR CREATIVITY GROW!

KEYSTONE brings design flexibility with a creative touch to commercial, governmental and residential projects. A plantable concrete retaining wall unit is now available with the proven structural integrity of Keystone's patented Retaining Wall System. The Planter Unit integrates naturally with Keystone Standard Units, fiberglass pins and geogrid soil reinforcement. This unique product allows for placement of irrigation systems, provides natural drainage and encourages plant root growth, allowing any site wall structure to spring to life. The Planter Units offer designers, contractors and owners a decorative option, along with a variety of textures and colors* to match, when building with the Keystone System.



P L A N T E R U N I T

The KEYSTONE Planter Unit allows the distinctive beauty of a KEYSTONE wall to blossom with plant life! The Planter Units are designed to be built as accent features in the Keystone Retaining Wall System. They work together with the Keystone "Standard Units" to create beautiful walls with superior structural performance.



| | |
|-----------------------|--|
| Unit Dimensions* | 8"h x 18"w x 21-1/2"d (200mm x 457mm x 545mm) |
| Face Area | 1 square foot |
| Unit Weight* | 95 lbs (43 kg) |
| Plantable Volume/Unit | 0.25 cubic feet (nominal) metric equivalent |

* Unit size, weight, color, texture and availability may vary by region. Consult your local Keystone Representative.

** Setback varies based on unit dimensions.

- ▶ Each Planter Unit has a setback of 5-1/2"*** (140mm) per 8" (200mm) course.
- ▶ Geogrid soil reinforcement is used with the same patented pin/grid mechanical connection provided with the Keystone family of structural retaining wall units.
- ▶ The Planter Units work well in straight wall and moderate curve applications. Contact Keystone for construction detail information regarding tight curves and corners.

F I B E R G L A S S P I N S



Keystone's patented pin system features high strength, pultruded fiberglass pins that provide a shear connector, geogrid proof positive holder, and alignment device all in one piece. Keystone's patented pin system ensures a positive mechanical connection between structural wall units and geogrids. The pins are the critical difference where Keystone provides the safety and security of a structural retaining wall solution!

Size (all unit types)

1/2" x 5 1/4" (13 x 133mm)

Tensile Strength

110,000 psi (758 kPa)

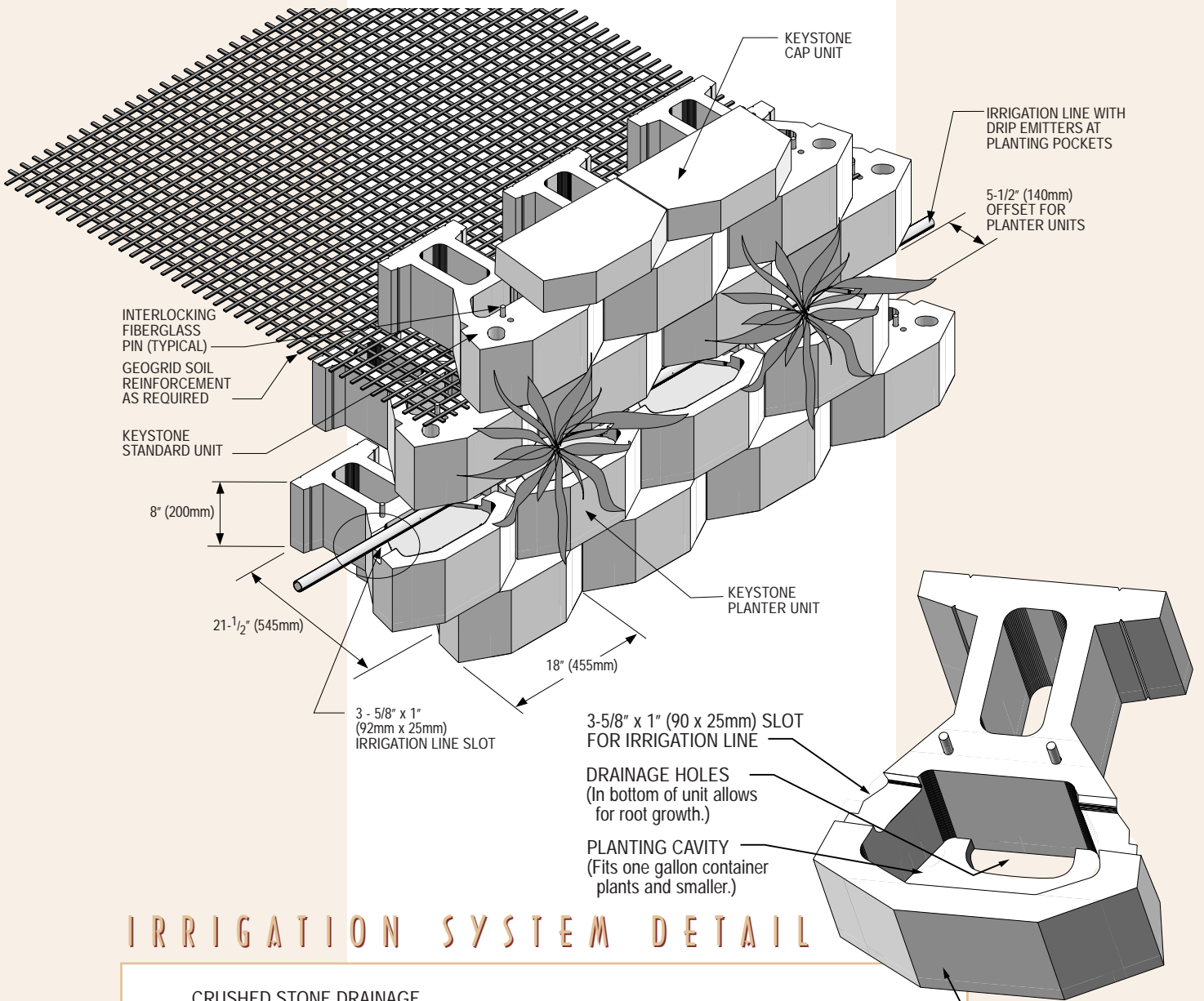
Flexural Strength

128,000 psi (822 kPa)

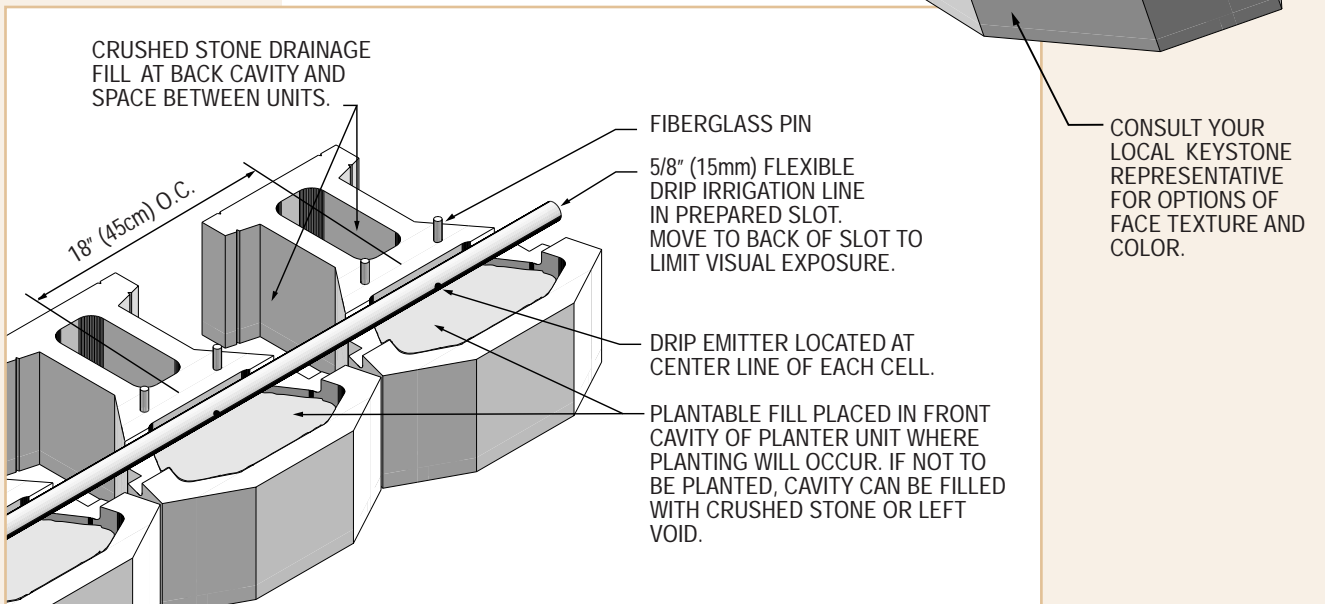
Short Beam Shear Strength

6,400 psi (44 kPa)

ASSEMBLY OF SYSTEM COMPONENTS



IRRIGATION SYSTEM DETAIL





I N S T A L L A T I O N S T E P S

The Keystone Retaining Wall System was developed with simplicity of construction in mind. For the basic step-by-step process of installing the portion of the wall using regular Keystone retaining wall units, refer to the installation instructions provided in literature available from your local Keystone Representative. These steps include the following:

- Step 1: Prepare the Base Leveling Pad
- Step 2: Install the Base Course
- Step 3: Insert the Interlocking Fiberglass Pins
- Step 4: Install and Compact Backfill
- Step 5: Geogrid Installation (as required by site conditions)
- Step 6: Install Additional Courses

PLANTER UNIT INSTALLATION

► Step 6a: Install Planter Units

At elevations shown in the design, place Keystone Planter Units over the pins of the Keystone units below. Pull the Planter Units forward, towards the face of the wall, to contact the pins below. It is best to place the Planter Units in a continuous row to maintain a constant setback. A useful design option at this step is to use landscape filter membrane beneath the Planter Unit to prohibit the flow of plantable soil into the crushed rock corefill of the units below or out through the face of the wall. **Place filter fabric prior to installing the Planter Unit.**

► Step 6b: Install Fiberglass Pins

Similar process to General Installation Instruction Step 3. Planter Units are slightly different in that they have only one location for pin placement affecting setback/batter versus (2) locations with regular Keystone units.

► Step 6c: Install Irrigation Lines

Select an appropriate irrigation drip line system for installation into the Planter Unit (maximum 1" [25mm] diameter). Place irrigation line into position with drip emitter locations centered on the planting cavity to be used. Note: Not all cavities are planted in every wall. Unused cavities can be left empty or filled with crushed stone core fill.

► Step 6d: Install Additional Courses

Follow General Installation Instructions Steps 3 through 6 and 6a through 6c until wall is completed to final height but prior to placement of cap units or coping.

► Step 6e: Install Planting Soil

Place planting soil in designated cavities. General soil mix is as follows:

- Porous and well drained but able to retain moisture
- Recommended container mixture
 - 1 part good garden soil (not clay)
 - 1 part sand (river or builders sand) or perlite
 - 1 part peat moss or nitrogen stabilized bark
- For acid loving plants alter mix to 2 parts peat moss
- Super absorbent polymers are a recent development that can increase water retention of a container soil mix. These gel-like polymers absorb hundreds of times their weight in water. In potting soil, the gel holds both water and dissolved nutrients for use by the plant roots. The gel also retains water that normally drains away, so plants still have a source of moisture when potting soil becomes dry.

► Step 6f: Installing Plants

Install selected plants in cavities with planting soil. Consider plant type based on performance related to wall/sun orientation, moisture requirements and maintenance needs. See "Planting Information" on page 5 for a partial list of recommended landscape plants to be used with Keystone Planter Units.

Step 7: Install Keystone Caps or Coping following Keystone's General Installation Instructions.

PLANTING INFORMATION

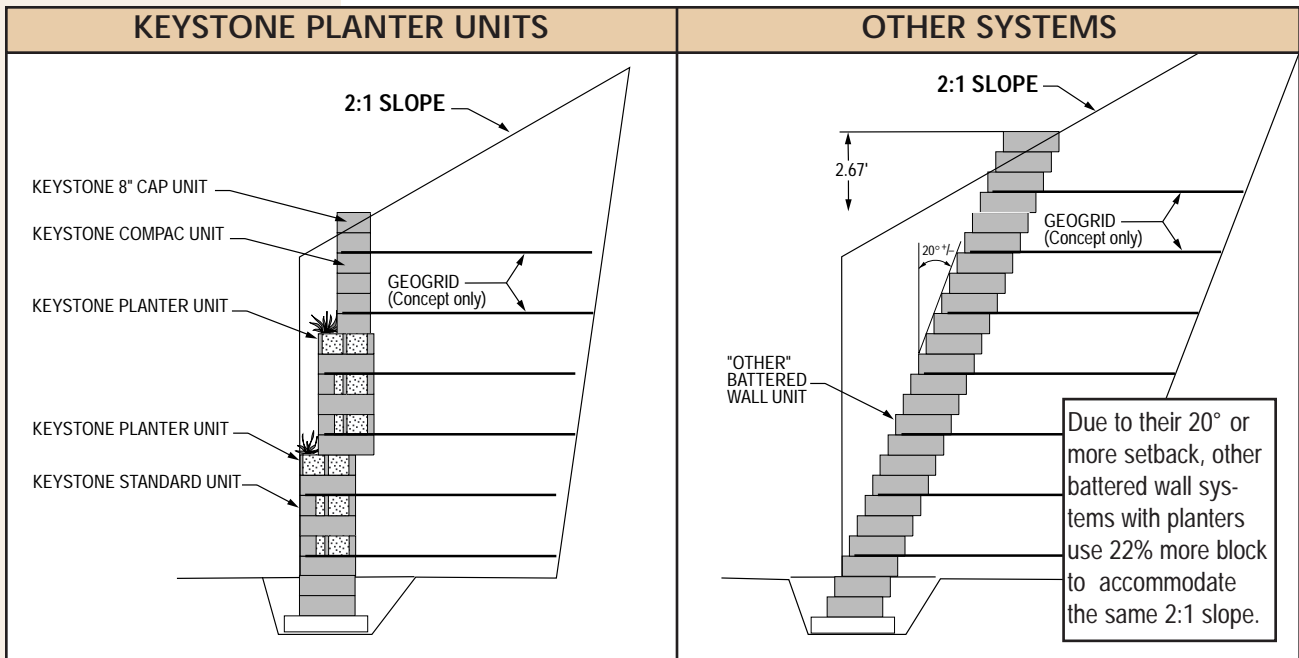
When considering planting materials, the design should address sunlight requirements, wall orientation relative to sun, wind and water, solar generated heat buildup in concrete units, irrigation needs, root growth, expansion potential and accessibility for maintenance.

| GENUS | FAMILY | COMMON NAME | PLANT TYPE | ZONE | SUN REQUIREMENTS | WATER REQUIREMENTS |
|------------------------------------|-----------------|-------------------------------|--|-------------------|--|-------------------------|
| ASPARAGUS, ORNAMENTAL | Liliaceae | Asparagus | Perennials | 12 - 24 | Full sun or partial shade | Regular |
| BOUGAINVILLEA | Nyctaginaceae | Bougainvillea | Evergreen shrubby vines | 22 - 24 | Full sun; light shade in hottest areas | Little once established |
| CISSUS | Vitaceae | Kangaroo Tree Vine | Evergreen vines | Varies | Full sun, except as noted | Needs vary by species |
| CLYTOSTOMA callistegioides | Bignoniaceae | Violet Trumpet Vine | Evergreen vines | 9, 12 - 24 | Full sun or partial shade | Moderate |
| DISTICTIS | Bignoniaceae | Red Trumpet Vine | Evergreen vines | Varies | Full sun or partial shade | Regular |
| FICUS | Moraceae | Ornamental Fig | Evergreen/deciduous trees, vines, shrubs. | Varies | Varies by species | Until established |
| GELSEMIUM sempervirens | Loganiaceae | Carolina Jessamine | Evergreen vines | 8 - 24 | Full sun | Regular |
| HARDENBERGIA | Fabaceae | Happy Wonderer | Evergreen shrubby vines | Varies | Sun, partial shade in hot areas | Do no over-water |
| LONICERA | Caprifoliaceae | Honeysuckle | Evergreen or deciduous trees, vines, shrubs. | Varies | Sun; light shade inland | Moderate (summer) |
| SOLLYA heterophylla | Pittosporaceae | Australian Blue Bell Creeper | Evergreen shrub or vine | 8, 9, 14 - 24 | Sun near coast, partial shade inland | Regular |
| TRACHELOSPERMUM | Apocynaceae | Star Jasmine | Evergreen vines or sprawling shrubs | Varies | Full sun, partial shade in hot areas | Regular |
| ABELIA GRANDIFLORA 'Prostrata' | Caparifoliaceae | Prostrate White Abelia | Evergreen shrub | 5 - 24 | Full sun or partial shade | Average |
| ARMERIA SETACEA | Plumbaginaceae | Armenia Juncea | Evergreen perennial | All zones | Full sun | Average |
| GENISTA PILOSA | Fabaceae | Vancouver Gold Bloom | Evergreen shrub | 2 - 22 | Full sun | Dry to moderate |
| HELICTOTRICHON SEMPERVIRENS | Poaceae | Blue Oat Grass | Evergreen grass | All zones | Full sun | Dry to average |
| COTONEASTER DAMMERI | Rosaceae | Canadian Creeper Cotoneaster | Evergreen shrub | Varies | Full sun | Average to dry |
| EUONYMUS FORTUNEI 'Colorata' | Celastraceae | Purple Leaf Winter Creeper | Evergreen ground cover | 1 - 17 5 - 10 | Full sun or full shade | Average |
| LIRIOPE MUSCARI 'Silvery Sunproof' | Liliaceae | Silvery Sunproof Lilyturf | Evergreen perennial | 12 - 24 | Full sun or partial shade | Moderate well drained |
| LONICERA JAPONICA 'Purpurea' | Caprifoliaceae | Purple Leaf Jap. Honeysuckle | Semi - evergreen vine | 2 - 24 | Full sun or light shade | Average |
| NANDINA DOMESTICA 'Harbor Dwarf' | Berberidaceae | Harbour Dwarf Heavenly Bamboo | Evergreen shrub - red | 5 - 24 | Full sun to partial shade | Average |
| ROSA x FLOWER CARPET 'Noatraum' | Rosaceae | Pink Flower Carpet | Evergreen shrub | All zones | Full sun or partial shade | Average very hardy |
| SPIREA x BUMALDA | Rosaceae | Dwarf Pink Bridal Wreath | Deciduous shrub | 1 - 11 14 - 21 | Full sun to light shade | Average |

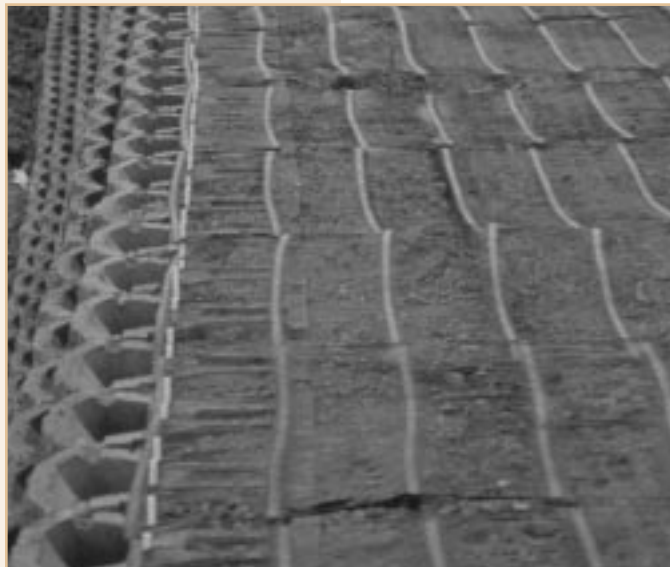
NOTE: The information set forth in this chart is for general information only. It should not be used or relied upon for any specific site application without independent professional examination to verify accuracy, suitability and appropriateness of application.

DESIGN CONSIDERATIONS

Keystone is not only a powerful structural wall solution, it is a system which offers unlimited design flexibility! The monolithic appearance of a Keystone retaining wall can be brought to life with greenery, using the Planter Units.



Various retaining wall products have different setback requirements for landscaped walls. The amount of setback can greatly impact the amount of land and surface area of wall needed to construct the retaining wall. Keystone Walls, using the Planter Units, have minimal setback requirements that allow for near vertical walls to be landscaped. The Planter Unit is designed to naturally integrate into the Keystone wall system. It can be installed into the wall structures at desired elevations in continuous rows. Because most plants recommended for use in the Planter Units are spreading vines, (see "Planting Information" on page 5), it is not necessary that the entire wall be built with planter units. Rows of landscape planting can be determined by design for maximum effect and maintainability.



Due to the internal connection method of high strength fiberglass pins and durable geogrid soil reinforcement, Keystone walls built with Standard Units and Planter Units can solve the most challenging structural problems while providing the added benefits of a naturally beautiful landscape solution.

Call your Keystone representative today to discuss using the Planter Unit on your next project!



► Torrey Reserve Unit 1 - San Diego, CA



► Home Depot - Escondido, CA



► Metropolitan Transit Development Board - San Diego, CA

- Planter Units provide integral pockets to hold planting soil, allowing plant roots a growth environment. Natural drainage is achieved by this mortarless yet interconnected system.
- The amount of planting in the wall is a function of design. Minimal to maximum plant use is controlled by how many rows of Planter Units are incorporated into the wall structure.
- Irrigation lines fit naturally into pre-formed slots, holding them in place while hiding them from view.





KEYSTONE PLANTER UNIT



▶ Southern California



▶ Pacific Coast Highway - Newport Beach, CA



▶ San Diego Zoo - Polar Bear Exhibit



The first. To last.



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