

RETAINING WALLS IN TEXAS



**STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
1987**

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THE USE OF RETAINING WALLS IN TEXAS

Doublewal



Doublewal
Elgin, TX
US 290

Doublewal is a well-proven system in Texas, although it has recently become less competitive. Doublewal has been constructed in Districts 2, 12, 14, 15 and 18.

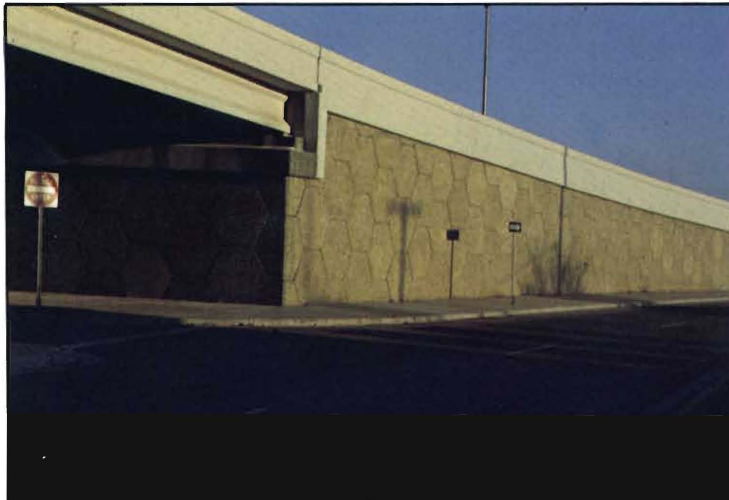
Doublewal is a gravity-type retaining wall system. It consists of interlocking components which require no fastening and may be disassembled, transported and re-used easily and economically.

Each precast concrete module is equipped with a Doublewal handling device; a crane is provided with a lifting mechanism. After each course is set, the modules are filled with earth and the backfill is placed and compacted.

A common complaint among Districts that have used Doublewal is the lack of field support from the company. The Doublewal corporation is based in Connecticut, and does not maintain an office in Texas.

Average wall prices are \$20-\$25 per square foot.

VSL Retained Earth



VSL Retained Earth
Brownwood, TX
US 377

Retained Earth also enjoys widespread use in Texas. Districts unfamiliar with proprietary retaining walls are encouraged to include Retained Earth since it is one of the most proven systems.

Retained Earth is a mechanically stabilized earth-type retaining wall system. The system uses steel mesh and select backfill to form the retaining wall mass and has a precast concrete fascia.

Design, construction and consultation are all provided as field support.

Retained Earth comes in a variety of panel sizes, textures, and colors to complement the natural or architectural surroundings.

Retained Earth walls have been built on State Department of Highways and Public Transportation projects since 1982 in Districts 2, 12, 14, 15, 16, 18, and 23. Average wall prices are \$18-\$22 per square foot.

Reinforced Earth

Reinforced Earth has enjoyed the longest use in Texas. It is one of the most proven systems. Therefore, Districts unfamiliar with proprietary retaining walls are encouraged to include Reinforced Earth.

Reinforced Earth is a mechanically stabilized earth-type retaining wall system. The system uses steel straps and select backfill to form the retaining wall mass and has a precast concrete fascia. Equipment may operate on any layer of backfill and professional assistance is provided during construction.

Reinforced Earth walls have been built on State Department of Highways and Public Transportation projects since 1976 in Districts 2, 12, 14, 15, 16, 18 and 21. Average wall prices are \$18-\$22 per square foot.



**Reinforced Earth
Austin, TX
Congress Avenue**

Hilfiker

Hilfiker is a mechanically stabilized earth-type retaining wall. It is similar to Reinforced Earth and Retained Earth except that it has three different types of wall faces available.

Hilfiker uses steel mesh and select backfill to form the retaining wall mass. All parts of the wall are preformed to be self-locating or interlocking and no exterior aligning or stabilizing structures are necessary. Length of the steel mats, wire sizes and galvanizing are designed for soil properties, anticipated loads and desired design life.

The Welded Wire Wall is the most economical of the three wall face types. The face may be battered or vertical, exposed, seeded or sprayed with air-blown mortar. This system is best suited for temporary walls.

Reinforced Soil Embankments use precast concrete panels. Only one panel shape is used; the face may be cast smooth, or with exposed aggregate or tint.

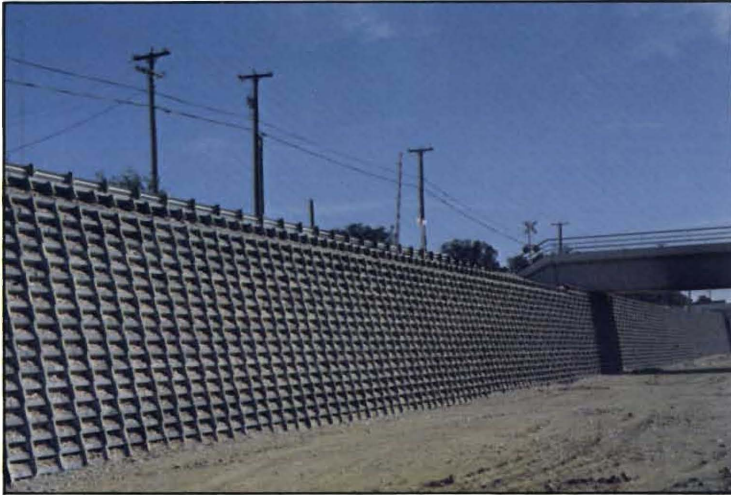
The Eureka Reinforced Soil Wall is similar to the Welded Wire Wall with the addition of cast-in-place footing and a full-height cast-in-place face.

The Eureka Reinforced soil wall system is currently being used in Districts 2 and 11 and is approximately \$16-\$20 per square foot. The precast system has not been built in Texas.



**Hilfiker
Lufkin, TX
Loop 287
(under construction)**

Camwall and Criblock



Criblock
San Antonio, TX
Loop 1604

Camwall and Criblock are gravity-type retaining wall systems which are well suited for rural area projects. It is the least expensive system, yet has the most limited application. Camwall and Criblock are best suited for holding the bottom of embankments and slopes or for slope repairs.

The systems are composed of interlocking reinforced concrete components which form an open grid. Select backfill is compacted into the bin formed by the concrete elements.

No cranes are required when building Camwall and Criblock, so virtually any site is accessible and smaller walls are economically feasible. Camwall and Criblock follow internal and external terrain curvature and create corner angles of all types.

Camwall and Criblock's open-grid patterns allow vegetation to grow through. Some districts, however, do not care for crib retaining walls because the drycast concrete surface does not provide a smooth finish. A wall with a closed face can be built but is substantially more expensive than the average price of \$12-\$16 per square foot. Two walls have been built in District 15.

Tensar



Tensar
El Paso, TX
US 62
(under construction)

Tensar is a mechanically stabilized earth-type retaining wall system which still has experimental status in Texas. Similar to Reinforced Earth, Retained Earth, and Hilfiker, Tensar is currently in use only in El Paso.

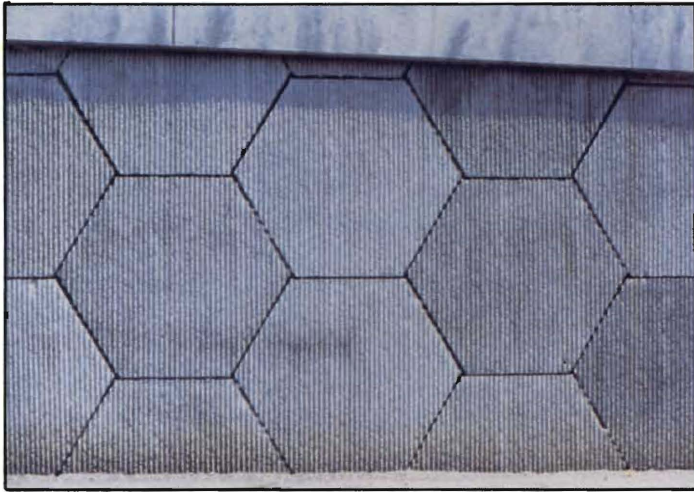
The system uses "geogrids," plastic mesh soil reinforcing materials that have a tensile strength comparable to steel. Because the geogrids are plastic, they can be used with soil types that corrode steel.

The geogrids are placed in layers in the soil fill behind the wall face to create a free-standing, stable soil mass. The resulting mass allows the use of a wide variety of different facing elements.

Tensar's pre-cast concrete facing panels are available as full-height panels, or as smaller, segmental panels. Both types of panels are available in a variety of finishes.

Wall price estimates are currently not available.

SURFACE FINISHES



**Fractured Fin
VSL**



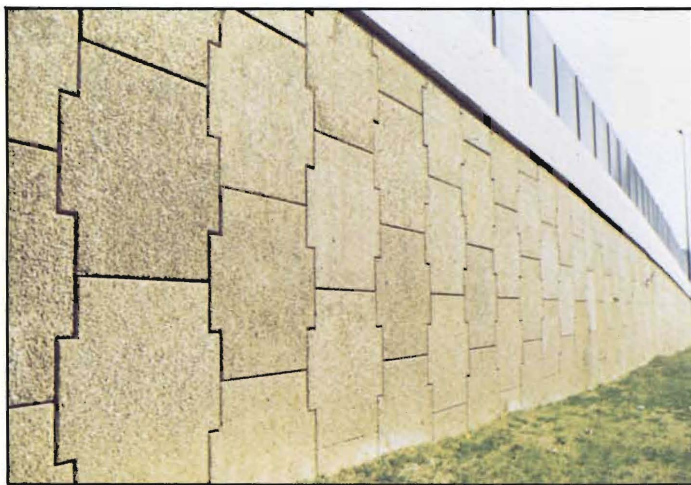
**Exposed Aggregate
VSL**



**Fractured Granite
Reinforced Earth**



**Exposed Aggregate
Doublewal**



**Exposed Aggregate
Reinforced Earth**



**Sandblasted Finish
VSL**



**Raised Relief
Reinforced Earth**



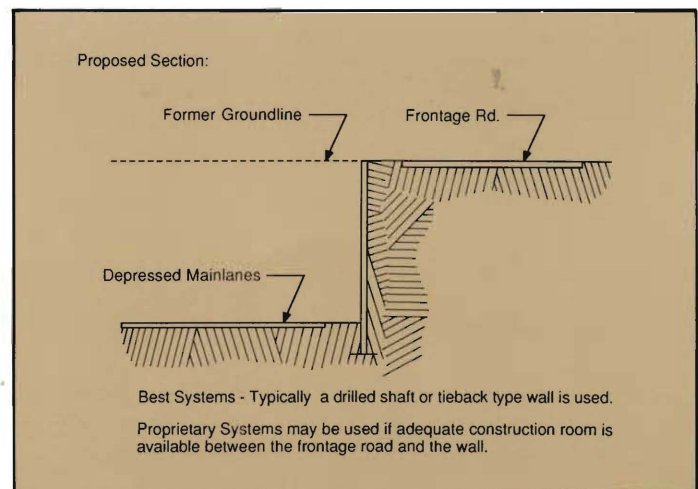
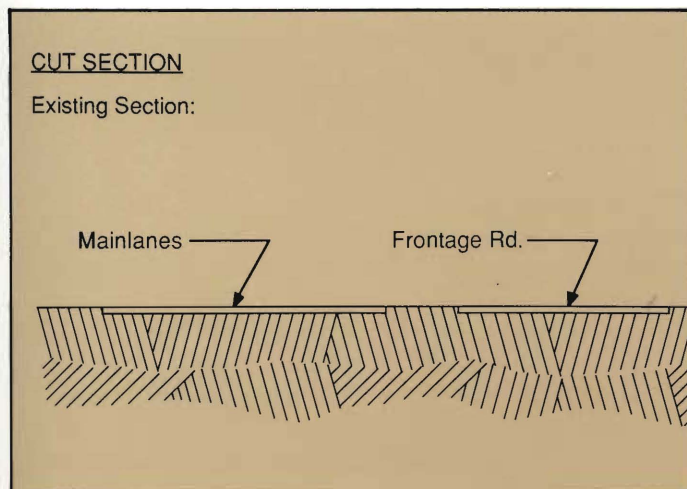
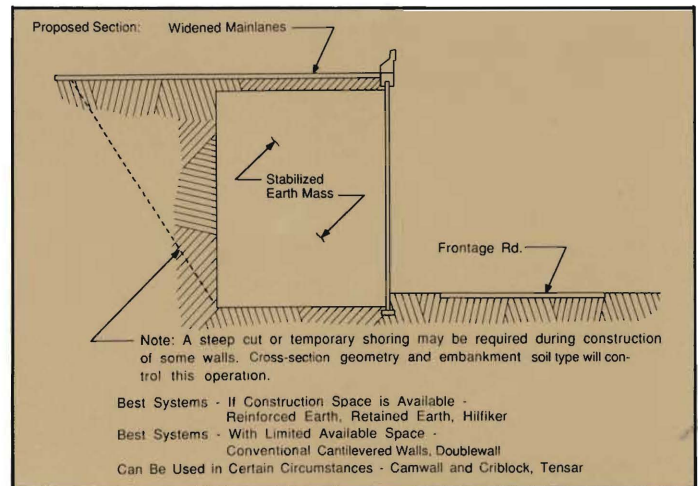
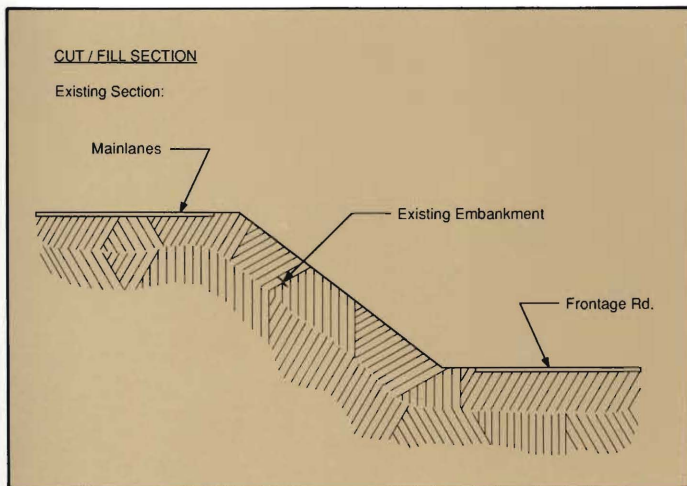
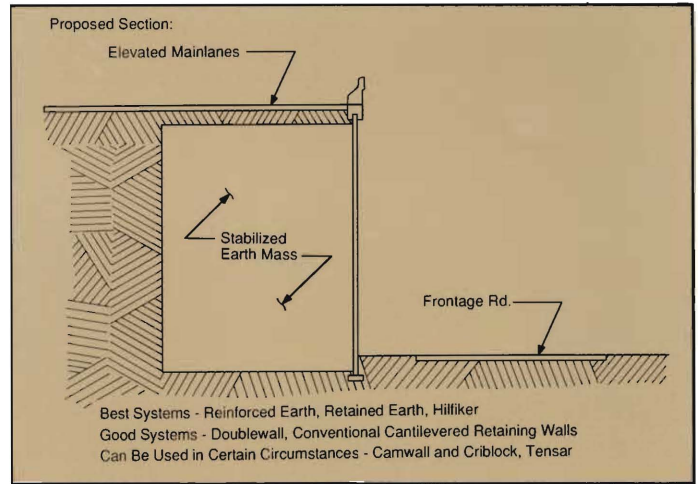
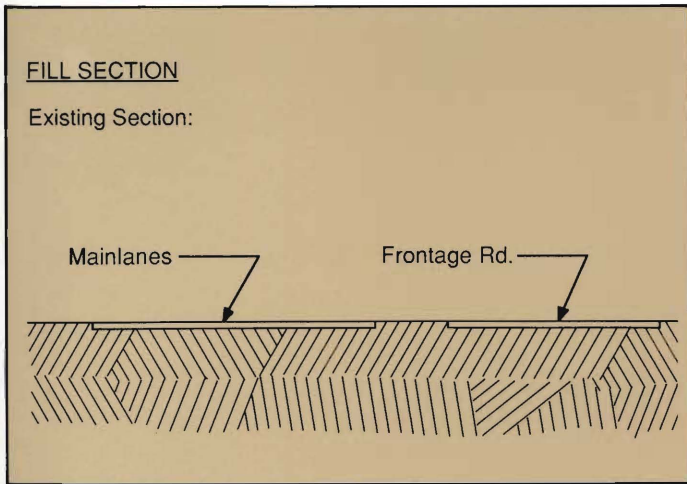
**Raised Relief
VSL**



Texas Emblem Insert

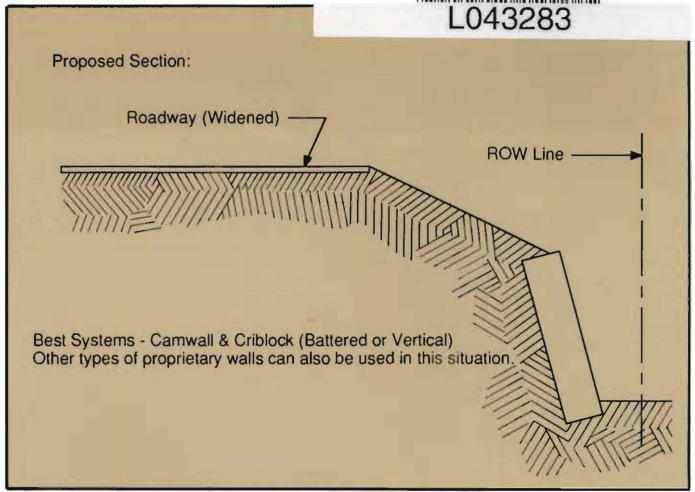
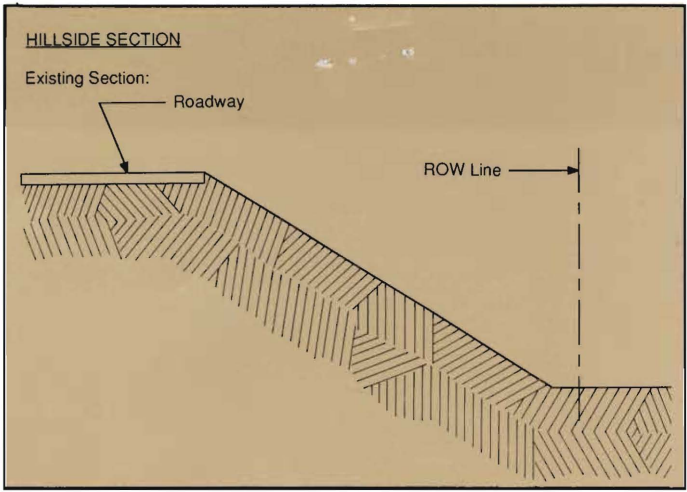
Most companies are very receptive to new panel designs or surface finishes. The Texas logo insert is one example of a specialized panel. The Department is now recommending that a map of the Texas emblem be formed into each wall next to a bridge abutment.

RETAINING WALL TYPICAL SECTIONS





L043283



The mentioning of brand names used is strictly for informational purposes and does not imply endorsement or advertisement of a particular product by the Texas State Department of Highways and Public Transportation or the Federal Highway Administration.

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