The KeySteel SQ FT MSE Wall System is a high performance retaining wall system constructed with the durable and aesthetic KeySteel units and KeyStrip in-extensible (steel) soil reinforcement. KeySteel SQ FT MSE Wall System combines the ease of construction of a segmental block retaining wall system with the performance of a traditional large panel MSE retaining wall; resulting in an extremely stable, aesthetically appealing and cost-effective retaining wall structure. KeySteel SQ FT MSE Wall System was designed, specifically, for use with highway and heavy construction projects.

**KeySteel® KeyStrip**

Available in Lengths from 8’ to 44’ (2.5m to 13m) (longer lengths will require special fabrication)

**Galvanized Steel Connection Pins**

\[ \frac{9}{16} \times 8'' \]

(14.3 x 200 mm)

**Keystone® Fiberglass Connection Pins**

\[ \frac{1}{2}'' \times 5\frac{1}{4}'' \]

(12.7 x 134mm)

*US 395, Spokane, WA*

*HITEC reviewed HITEC CERF Report #40478. Aug 2000*

*KeySteel SQ FT is designed and manufactured to meet current AASHTO LRFD specification.*
Features, Benefits & Applications

Durable Components
- Design life of 75 years for typical structures, and up to 100 years for critical structures.

Aesthetic Appeal
- Variety of color, texture and pattern options.

Design Flexibility
- Easily accommodates curves, corners and unique geometries.

Cost-Effective Results
- Comparable cost-effectiveness of SRW with the strength and reliability of MSE walls.

Handles the Most Demanding Projects
- Wall deflections of KeySteel SQ FT walls are 3x less than geosynthetic reinforced walls.

Ideal Applications:
- River & Flood Walls
- Bridge Abutments
- Rail Transportation
- Roadway Support
- Headwalls & Wingwalls

Elbow Junction, Alpine to Hoback, WY
KeySteel® SQ FT MSE Wall System
vs. Large Panel Systems (MSE)

- Cost effectiveness of Segmental Retaining Walls (SRW) with the strength and reliability of Mechanically Stabilized Earth (MSE) walls.
- Replaces the logistics of handling multi-piece precast panels, eliminating job site delays due to damaged or miscast panels, or a change in the project construction path.
- Follows top & bottom grade lines closer than large panels, reducing average wall heights; thereby reducing wall area, reinforcement length, foundation excavation & disposal, and reinforced fill quantity.
- Provides labor cost savings through the use of smaller crews and the economies of unskilled workers.
- KeySteel units do not require the use of cranes; they can be staged with skid steer- sized equipment and hand placed.
- Creates a more flexible facing system, handling most foundation settlements without employing slip joints.
- KeySteel units easily allow for curvilinear wall geometry.
- The KeySteel flexible wall face is capable of tolerating minor differential settlement without breakage, eliminating the need for bearing pads and wedging.
- No need for special panel fabrication; KeySteel units can be field cut and hand placed to match protrusions through the facing.

Inextensible KeySteel® SQ FT MSE Wall System vs. Extensible Reinforcement (SRW)

- Cost competitive as Segmental Retaining Walls (SRW) with the strength and reliability of steel reinforcement.
- KeySteel KeyStrips allow heavy loads to be carried at low strains without long-term creep deformation problems (cracked pavements, moved superstructures, etc...).
- Superior ease and speed of installation, compared to extensible reinforcement.
- Eliminates geogrid “roll-up” due to HDPE memory.
- Eliminates pre-tensioning and anchorage of geogrid.
- Positive mechanical steel pin connection system eliminates facing unit and geogrid separation during backfill and compaction efforts.
- Partial coverage of reinforcement allows KeySteel KeyStrip to be located around obstructions.
- Connection capacity of KeySteel KeyStrip to KeySteel unit is more than 4X that of geogrid connections.
- More easily maintains near-vertical wall alignment with inextensible vs extensible reinforcement.
- Backfill cost significantly reduced using 4 inch (100mm) maximum size stone vs ¾ inch (20mm) max allowable gravel with geogrid reinforcement.

KY92 Bridge over I-75, Whitley County, KY
**KeySteel® SQ FT MSE Wall System Construction Sequence**

**STEP 1**
EXCAVATION

- Drainage Notes:
  - When site conditions require, wrap drainage tile in ¾" (19mm) aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

**STEP 2**
PLACE LEVELING PAD

- Place galvanized or fiberglass pins in pin holes for the next course above (Typ).

**STEP 3**
PLACE AND ALIGN BASE COURSE / DRAINAGE

- Set and align the base course drainage pipe (as required).

**STEP 4**
PLACE PINS, UNIT/ DRAINAGE MATERIAL, COMPACTED BACKFILL

- Fill unit voids and area between units with drainage fill.

**STEP 5**
COREFILL AND BACKFILL

- Place the next course aligning the kidney holes with the pins in the course below, then slide forward to contact pin with kidney.

**STEP 6**
PLACE REINFORCEMENT, AS REQUIRED

- Where the design requires, place the KeyStrip reinforcement over galvanized steel connector pins and on level and uniform compacted backfill.

**STEP 7**
ALTERNATE CONSTRUCTION COURSES

- Alternate construction courses until all KeySteel units are installed.

**STEP 8**
KEYSTEEL FINISHED GRADE

- Place finished grade and landscaping.

**Existing grade**
(varies)

- See drainage notes

**Approximate limits of excavation**

**Existing Ground**
• Copings, impact barriers, railing options, construction slip joints, curves and corners are all possible design elements with KeySteel SQ FT MSE Wall System; without the need and expense of specialized moldings and custom fabrication.

• KeySteel SQ FT MSE Wall System is the right choice for tall wall applications. KeySteel has successfully been used to construct walls with heights up to 65 ft. (15 m) and a variety of heavy loading conditions.

• Seismic design loads are easily factored into the KeySteel SQ FT MSE Wall System design analysis. The semi-flexible (MSE) system handles seismic events better than more rigid systems. KeySteel structures have a proven track record of high performance, withstanding seismic events in the Pacific Rim and Western United States without failure or significant detrimental effects on the wall structure.

• KeySteel SQ FT MSE Wall System is an ideal end treatment for Contech Structural Plate and Box Culvert installations due to its inherent modular design. The KeySteel units can be field modified to follow the curvilinear shape of arches; eliminating the need for custom forming or specialty precast panels.

Design Flexibility Creates Value

Top of Wall Options

CIP COPING

BARRIER

GUARDRAIL

4" (100mm) CAP
The strength and performance of a retaining wall system is an obvious top consideration for wall specifiers and designers. KeySteel SQ FT MSE Wall System is one of the strongest and most durable retention solutions available. It features patented concrete units that are manufactured to meet all AASHTO standards. The units are dry stacked and interlocked vertically and horizontally, using high-strength fiberglass pins and galvanized steel pins, to create a mechanically interlocked facing system.

**Heavy Loads**

![Picardy Avenue/ I-10 Interchange](image)

This zone shall be backfilled prior to placing bridge beam and deck.

![Bridge Loads](image)

Top KeyStrip shall be angled down to clear bridge abutment.

![Slip Joint Details](image)

Styrofoam Sponge Joint Material (Cont.)

Bridge Support & Slip Joint

1" Closed Cell Neoprene Sponge Joint Material (Cont.)

Levelling Concrete (3" min)

Top Two Units - Straight Face or Tri-Plane at Contractors Option

KeySteel SQ FT Unit

KeyStrip Length

KeyStrip Length

Finished Grade

Levelling Pad

4" Dia. Perforated Pipe with Free Drainage

Foundation Soil

Foundation Soil

Levelling Pad

Foundation Soil

Retained Soil

Retained Soil

Leveling Pad

Reinforced Soil

Reinforced Soil

Foundation Soil

Foundation Soil

Top Two Units - Straight Face or Tri-Plane at Contractors Option

Styrofoam KeyStrip Steel

KeyStrip Length

KeyStrip Base Length

KeySteel SQ FT Unit

KeyStrip Length

KeyStrip Length

15º Max.

Keystone Cap Unit

15º Max.

KeyStrip Length

KeyStrip Length

15º Max.

Keystone Cap Unit

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15º Max.
We know retaining walls.

With over 30 years at the forefront of the industry, Keystone Retaining Wall Systems LLC, a Contech Company, continues to set the standard for excellence and innovation within the segmental retaining wall industry. Keystone represents the global benchmark in soil retention, erosion control and landscape systems. Holding numerous patents, Keystone symbolizes cutting-edge design, performance and aesthetics.

We are your partner.

When KeySteel SQ FT MSE Wall System is specified, a complete retaining wall system is engineered and supplied to meet site-specific conditions. In addition, Contech ensures the timely arrival and sequencing of materials for construction. Contech is your single source supplier: design support, KeySteel units, KeySteel KeyStrips, galvanized steel and fiberglass connection pins.

Contech has representatives in your area to help assist in planning, design and installation.