RETAINING WALL SYSTEMS
FOR BRIDGE ABUTMENTS AND
SEISMIC APPLICATIONS
KEYSTONE KEYSTEEL® WALL SYSTEM IS A WORLD-CLASS STRUCTURAL RETAINING WALL SYSTEM, SPECIFICALLY DESIGNED FOR USE WITH HIGHWAYS AND HEAVY CONSTRUCTION. KEYSTEEL® COMBINES PATENTED KEYSTONE® MODULAR CONCRETE UNITS AND INEXTENSIBLE STEEL SOIL REINFORCEMENT TO DEVELOP AN EXTREMELY STABLE, AESTHETICALLY APPEALING AND COST-EFFECTIVE RETAINING WALL STRUCTURE.

KEYSTONE KEYSTEEL® AESTHETIC OPTIONS INCLUDE A WIDE RANGE OF COMPLETED WALL APPEARANCES WITHOUT THE HIGH COST OF CUSTOMISATION.

KEYSTEEL® ALSO UTILISES DESIGN METHODOLOGY AND MATERIAL COMPONENTS THAT COMPLY WITH THE STANDARDS FOR INEXTENSIBLE REINFORCEMENT AS OUTLINED IN THE CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
DESIGN FLEXIBILITY
Curves, corners and unique geometries

For outside curves, Keystone Compac® S minimum radius of top layer shall be 1400mm to avoid cutting of units. Fill pieces will be necessary as radius increases in lower units to maintain running bond.

EASE OF CONSTRUCTION
Quick and easy, no cranes required

DURABLE COMPONENTS
Inextensible steel reinforcement. Design life of 75 years for typical structures and up to 100 years for critical structures.

COST-EFFECTIVE RESULTS
Competitive with other MSE structures

INTENDED FOR THE MOST DEMANDING JOBS
Deflections with steel reinforcement are 3x less than geosynthetic structures

IDEAL FOR DEFLECTION SENSITIVE APPLICATIONS
Such as bridge abutments, tall walls, walls with heavy surcharges & walls where loads or structures bear on or are immediately behind the reinforced mass.
KEYSTEEL® MODULAR COMPONENTS INTERLOCK IN A RUNNING BOND PATTERN, UTILISING FIBERGLASS ALIGNMENT PINS AND GALVANISED STEEL CONNECTION PIN
THE STRENGTH AND PERFORMANCE OF A RETAINING WALL SYSTEM IS AN OBVIOUS TOP
CONSIDERATION FOR WALL SPECIFIERS AND DESIGNERS. KEYSTEEL® IS ONE OF THE MOST
DURABLE RETENTION SOLUTIONS AVAILABLE. IT FEATURES PATENTED CONCRETE UNITS THAT
ARE MANUFACTURED TO A MINIMUM COMPRESSIVE STRENGTH OF 30MPa.

The units are dry stacked and interlocked vertically and horizontally using high-strength fiberglass pins and galvanized steel pins. This method provides a very strong, mechanically interlocked facing system. KeySteel® is also the ideal product for tall walls.

Many walls using KeySteel® have been constructed to over 15m with a variety of loading conditions. KeySteel® steel soil reinforcement offers an economical and extremely strong structural solution for tall walls and extreme loading conditions.
KEYSTEEL® 0.09M² PANEL SYSTEM CONSTRUCTION

1
EXCAVATION

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

Existing grade (varies)

See drainage notes

Existing ground

Approximate limits of excavation

2
PLACE LEVELING PAD

Overlap stepped base course 1 1/2 panels on sloping grade

Excavation Limits

200mm or 400mm wall step

600x150mm Unreinforced concrete leveling pad

Levelling pad
3 PLACE & ALIGN BASE COURSE/DRAINAGE

- Drainage pipe (as required)
- Set & align the base course
- Pin hole
- Align units along pin holes or back of unit
- Keysteel® 0.09m² Panel
- Front face of panel

4 PLACE UNIT / DRAINAGE MATERIAL, COMPACTED BACKFILL

- Limit of Ride-on mechanical compaction equipment 1.3m from front face of wall
- Limit of walk behind mechanical compaction equipment 0.8m from front face
- Compacted wall backfill zone (each course) 95% Standard Proctor
- Unit drainage fill (each course)
- 600mm unit drainage fill zone (19mm crushed rock or stone)
- Only hand held mechanical compaction equipment allowed on top of Keysteel® Unit
- Place galvanised or fiberglass pins in pin holes for the next course above (Typ)
- Fill panel voids & area between units with drainage fill
5
COREFILL & BACKFILL

Place the next course aligning the pin receiving cores with the pins in the course below, then slide the unit forward to engage the pin with the back of the pin receiving cores.

Sweep off top of unit prior to placing next course
Passive soil wedge backfill

300mm
Finished grade

6
PLACE LEVELING PAD

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

KeyStrip reinforcement on level compacted backfill
KEYSTEEL® FLEXIBILITY OFFERS SEISMIC & AESTHETIC BENEFITS

Seismic design loads are easily factored into the KeySteel® design analysis. The semi-flexible nature of the (MSE) system allows for better performance turning seismic events than more typical rigid structures. As noted in a variety of studies done on these systems after seismic events.

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.

Copings, crash barriers, railing options, construction slip joints, curves and corners are all possible design elements in the KeySteel® package, without the need for specialised moldings and custom fabrication.
THE KEYSTONE® ADVANTAGE

WHEN KEYSHEEL® IS SPECIFIED, A COMPLETE RETAINING WALL SYSTEM IS ENGINEERED AND SUPPLIED TO MEET SITE SPECIFIC CONDITIONS. THEY ALSO ENSURE TIMELY ARRIVAL AND SEQUENCING OF MATERIALS FOR CONSTRUCTION. AFTER OVER 30 YEARS AT THE FOREFRONT OF THE INDUSTRY, KEYSTONE RETAINING WALL SYSTEMS®, Inc. 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 over 180 patents / patents pending, Keystone® symbolises cutting-edge design, performance and aesthetics.

Keystone® partners with the best network of product developers, engineers, sales professionals and manufacturers in the business. They help ensure that Keystone® offers the best in site solutions for residential, commercial, recreational, industrial and government applications.