KEYSTONE RETAINING WALL SYSTEMS
A CONTECH COMPANY

Firth

JUNE 2017

+KeySteel®

RETAINING WALL SYSTEMS

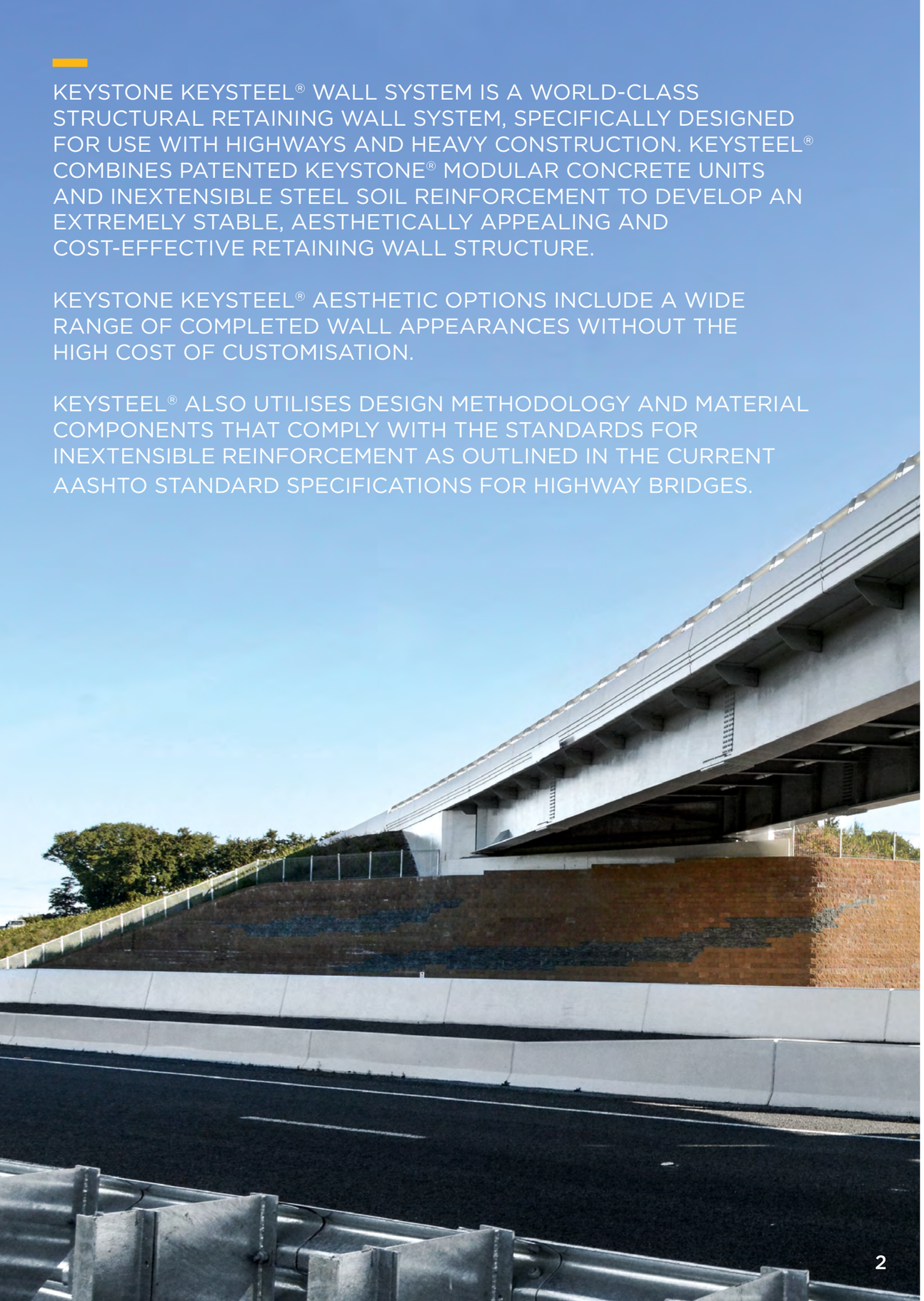
FOR BRIDGE ABUTMENTS AND
SEISMIC APPLICATIONS

CBI 3321/3323

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.

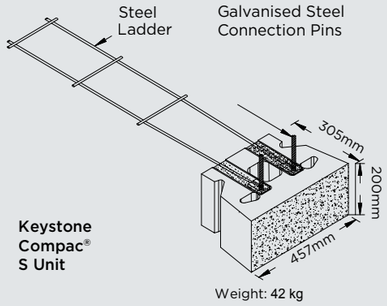
KEYSTONE KEYSTEEL® AESTHETIC OPTIONS INCLUDE A WIDE RANGE OF COMPLETED WALL APPEARANCES WITHOUT THE HIGH COST OF CUSTOMISATION.

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.

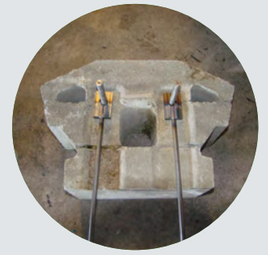


DESIGN, INSTALLATION & SPECIFICATION CONSIDERATIONS

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

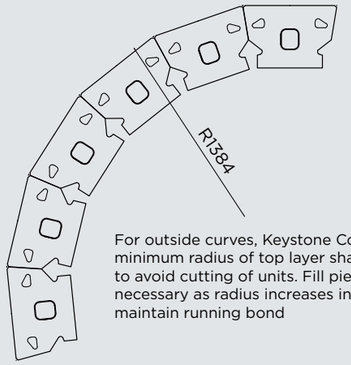


DOUBLE HOTDIPPED GALVANISED LADDER CONNECTION PLATE



RECESSES IN KEYSTEEL® UNIT TO ACCOMMODATE STEEL LADDER

DESIGN FLEXIBILITY
Curves, corners and unique geometries



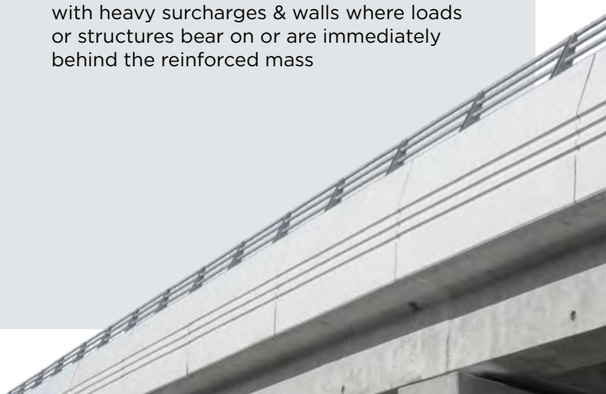
For outside curves, Keystone Compac® S minimum radius of top layer shall be 1400mm to avoid cutting of units. Fill pieces will be necessary as radius increases in lower units to maintain running bond

EASE OF CONSTRUCTION
Quick and easy, no cranes required

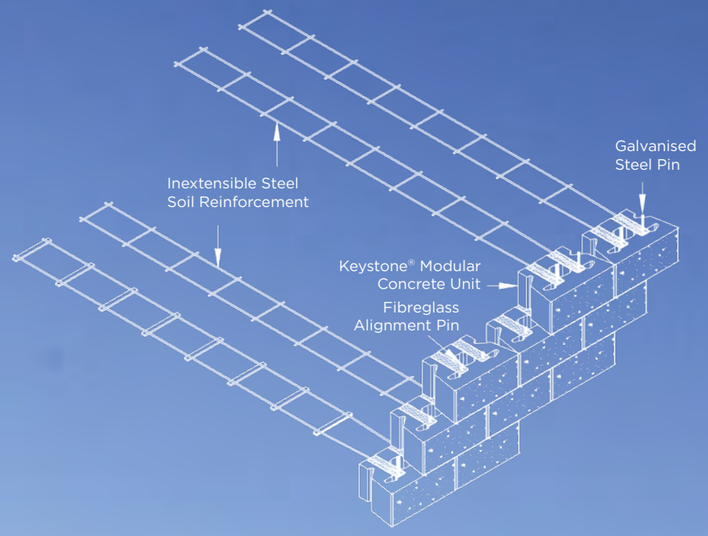
COST-EFFECTIVE RESULTS
Competitive with other MSE structures

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 →



KEYSTONE KEYSTEEL®

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.

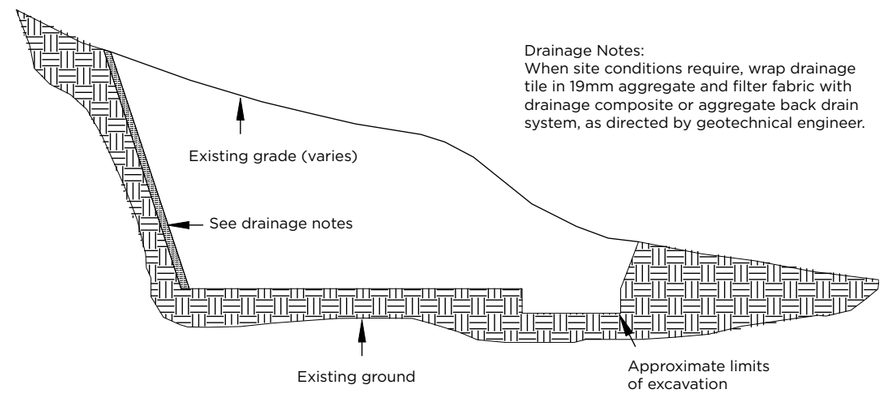
KEYSTEEL® FEATURES PATENTED CONCRETE UNITS MANUFACTURED TO A MINIMUM COMPRESSIVE STRENGTH OF

30 MPa

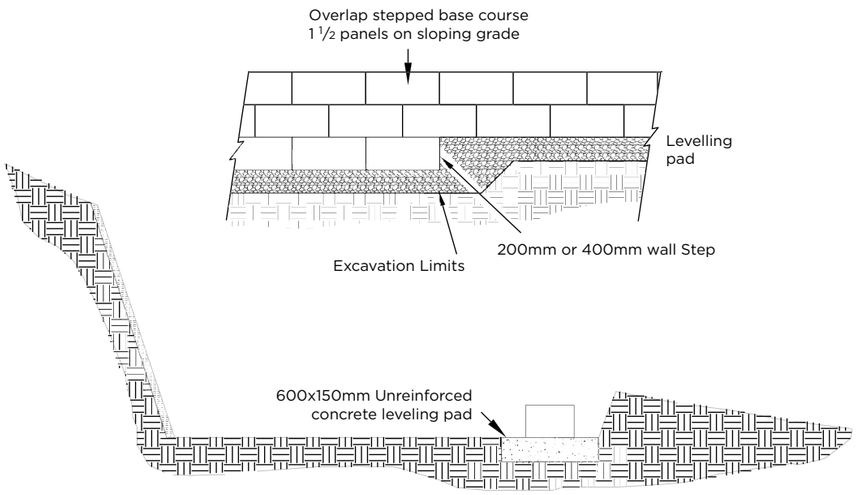
WAIKATO EXPRESSWAY: CAMBRIDGE TO TAMAHERE
FIRTH KEYSTONE KEYSTEEL®

KEYSTEEL® 0.09M² PANEL SYSTEM CONSTRUCTION

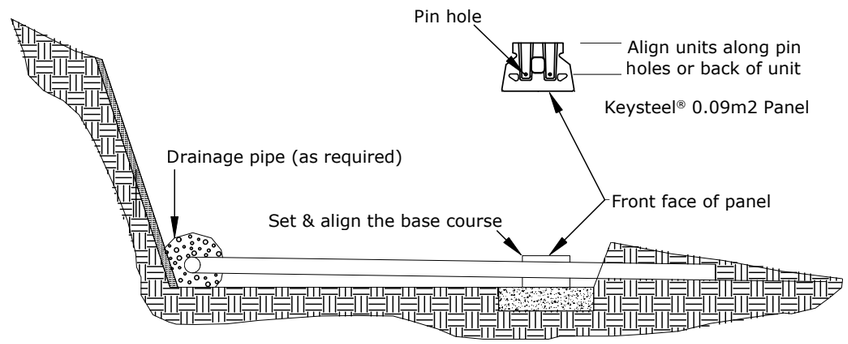
1
EXCAVATION



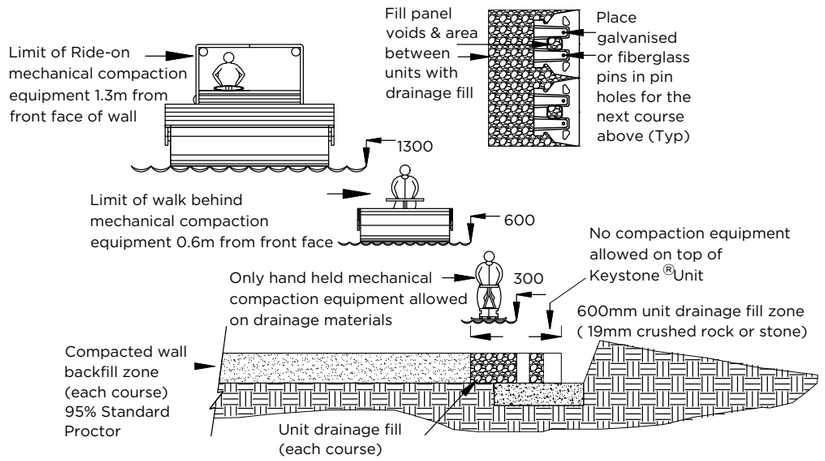
2
PLACE LEVELING PAD

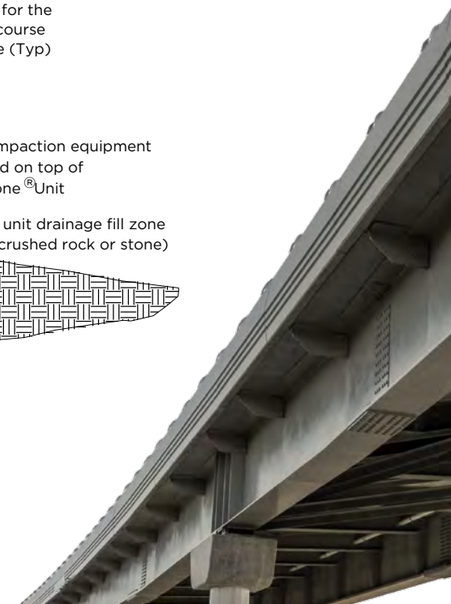


3
PLACE & ALIGN BASE COURSE/DRAINAGE



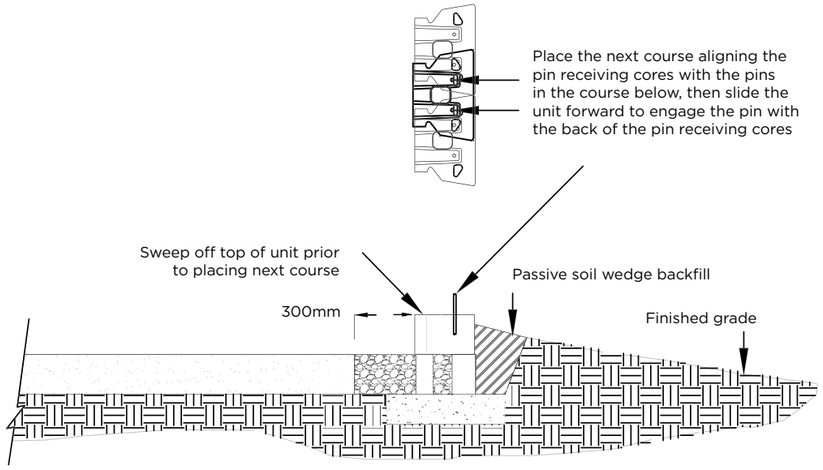
4
PLACE UNIT / DRAINAGE MATERIAL, COMPACTED BACKFILL





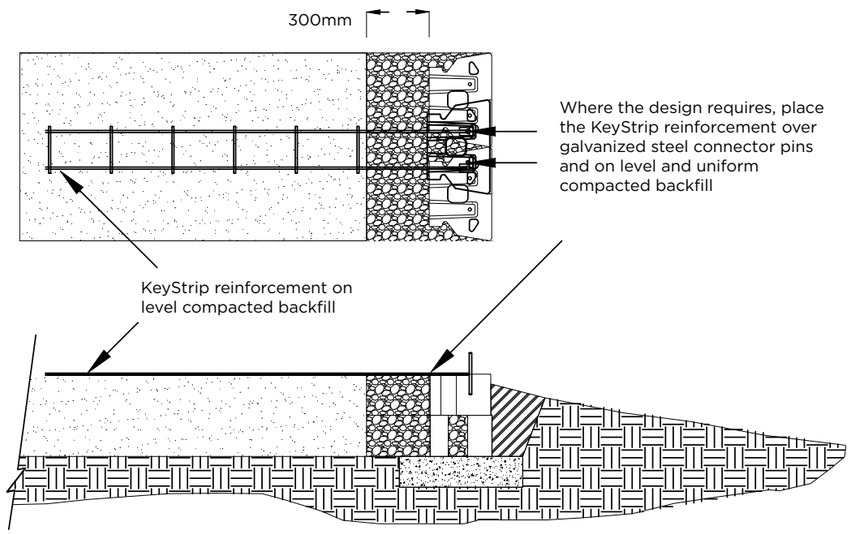
5

COREFILL & BACKFILL



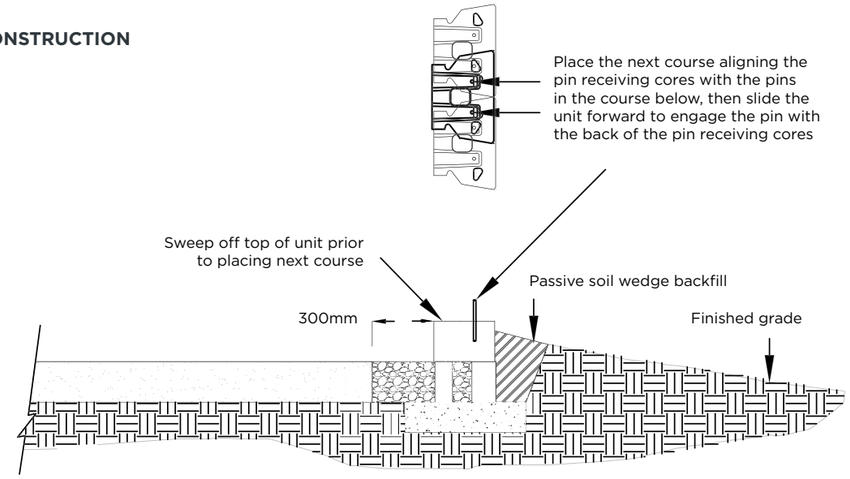
6

PLACE LEVELING PAD



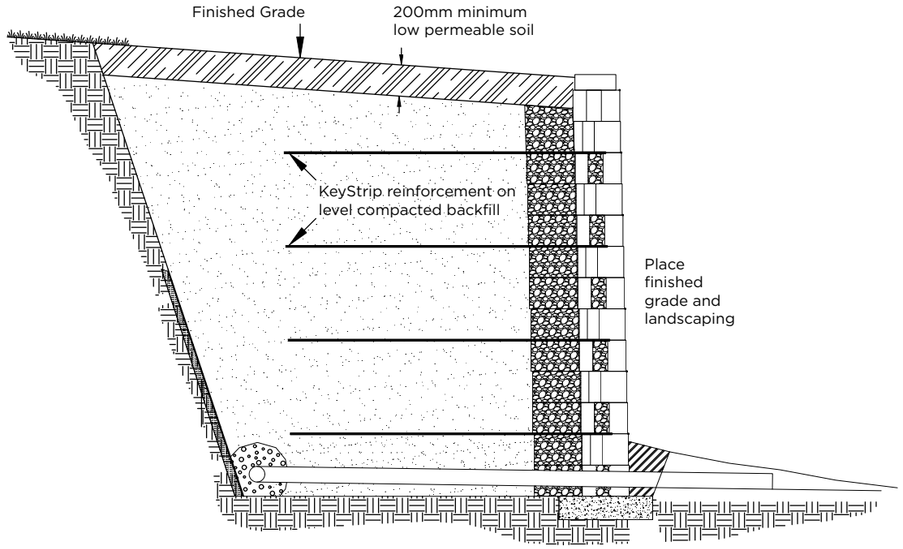
7

ALTERNATE CONSTRUCTION COURSES



8

KEYSTEEL® FINISHED GRADE



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 KEYSTEEL® 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.

DESIGNED TO STAND FOR UP TO

100 YEARS