Lists of Roads and Maritime Services (RMS) Approved Bridge Components and Systems

1. Proprietary Bridge Expansion Joints

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Joint Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freyssinet Australia</td>
<td>CIPEC WP Series steel fingerplate joints: WP250, WP300, WP350, WP400, WP450, WP500, WP550, WP600</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>GRANOR/ETIC SFEJ series steel fingerplate joints: SFEJ 150, SFEJ 200, SFEJ 250, SFEJ 300, SFEJ 350, SFEJ 400, SFEJ 450, SFEJ 500, SFEJ 550, SFEJ 600</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Freyssinet Australia</td>
<td>CIPEC Wd110, Wd160, Wd230C</td>
<td>Saw tooth (See Note 1)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>ETIC: EJ-110, EJ-160, EJ200 and EJ250R ('R' indicates reduced maximum opening.)</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Freyssinet Australia</td>
<td>CIPEC WOSd 75 AUS-R CIPEC WOSd 100 AUS-R</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>Granor Ausflex: Type AC-AR with Chloroprene seal sizes 75D, 100D, 125D and 100F</td>
<td>Strip seal (See Note 1)</td>
</tr>
<tr>
<td>Trelleborg Engineered Systems Australia</td>
<td>SSA100</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Evolution Civil Maintenance</td>
<td>Britflex BEJ (Rehabilitation of expansion joints only)</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>Watson Bowman Acme: Series WA and WG</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>XJS System (Rehabilitation of small movement joints)</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Trelleborg Engineered Systems Australia</td>
<td>PHS (Polimer Header System) Rehabilitation of small movement joints with the maximum opening of 45 mm</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
<tr>
<td>Parchem</td>
<td>Emer-Seal: Fosroc Nitoseal SC820 (Type 1 sealant) Fosroc Nitoseal SC800 (Type 2 sealant) Fosroc Nitoseal PU400 (Type 3 sealant) (Refer to RMS B312 for sealant type definition)</td>
<td>Fingerplate (See Notes 1, 2 &amp; 3)</td>
</tr>
</tbody>
</table>

Notes:
1. Recess for anchors in top surface must be filled with approved sealant such as Nitoseal PU400 after tightening.
2. Provide stainless steel drainage troughs for new bridges.
3. These joints may have large gaps, and may not suit the use of cyclists or pedestrians. Designers must check the suitability of these joints for the bridge use and conditions.
4. Designers must verify the adequacy of sealants for the joint gap and proposed movement range prior to use. Submissions for use of other than the approved joint sealants in specific cold applied sealant joint applications must be reviewed by the Senior Bridge Engineer (Capability and Special Projects), RMS Bridge and Structural Engineering.

2. Proprietary Bridge Bearings

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Bearing Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freyssinet Australia</td>
<td>Tetron CD FX/GL/GG</td>
<td>Pot (See Note 1)</td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>GPFF, GPFX and GPGS</td>
<td></td>
</tr>
<tr>
<td>mageba (Australia) Pty Ltd</td>
<td>RESTON</td>
<td>Spherical (See Note 1)</td>
</tr>
<tr>
<td>Trelleborg Engineered Systems</td>
<td>Maurer-Sohne with MSM®</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freyssinet Australia</td>
<td>Freyssinet</td>
<td></td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>Series A to K, Series N to Y</td>
<td>Laminated elastomeric</td>
</tr>
<tr>
<td>mageba (Australia) Pty Ltd</td>
<td>LASTO BLOCK (Type B)</td>
<td></td>
</tr>
<tr>
<td>Trelleborg Engineered Systems</td>
<td>Trelleborg</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granor Rubber &amp; Engineering</td>
<td>Granor® Elastomeric Bearings</td>
<td>Unreinforced elastomeric pads and strips</td>
</tr>
<tr>
<td>mageba (Australia) Pty Ltd</td>
<td>LASTO Pads and Strips</td>
<td></td>
</tr>
<tr>
<td>Trelleborg Engineered Systems</td>
<td>Trelleborg</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Provisionally Approved Bearings

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Bearing Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>mageba (Australia) Pty Ltd</td>
<td>RESTON</td>
<td>Spherical (See Note 1)</td>
</tr>
</tbody>
</table>

Note:
1. Approval of pot and spherical bearings was based on sample designs provided by the suppliers. Prior to supply to projects, bearings must be designed and independently verified to ensure conformance with RMS relevant specifications and AS 5100.4.
3. Proprietary Bridge Deck Waterproofing Membranes to Specification RMS B343

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Waterproofing System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stirling Lloyd</td>
<td>Eliminator</td>
<td>Sprayed methyl methacrylate resin</td>
</tr>
</tbody>
</table>

Provisionally Approved Systems

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Waterproofing System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolution Civil Maintenance</td>
<td>Pitchmastic PmB</td>
<td>Liquid applied membrane</td>
</tr>
<tr>
<td>Evolution Civil Maintenance</td>
<td>Britdex MDP</td>
<td>Liquid applied membrane</td>
</tr>
<tr>
<td>Hychem International Pty Ltd</td>
<td>RPM Belgium Matacryl® WPM</td>
<td>Liquid applied membrane</td>
</tr>
</tbody>
</table>

4. Proprietary Slip Resistant Coatings

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Skid resistant coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cormac Metal Spray</td>
<td>Cormac TH604</td>
<td>Aluminium + ceramic oxide metal spray (see Note 1)</td>
</tr>
</tbody>
</table>

Note:
1. Cormac TH604: In high wear situations, surface skid resistance to be checked at regular intervals and coating to be reapplied as required.

5. Proprietary Post-Tensioning Systems

(Refer to RMS QA Specification B113)

**General Note:** Bursting reinforcement in post-tensioning local anchorages is in accordance with AS5100.5 except stated otherwise for the post-tensioning system.

**DSI Pty Ltd**

1. DSI Threadbar System comprising:
   a. Stressing and Non Stressing Anchorage: Square plate and domed anchor nut without grout slot;
   b. Coupling: Cylindrical movable coupling system types D and G and fixed coupling system;
   c. Hot-rolled ribbed bar sizes of 26, 32, 36 and 40 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.
2. DSI Factory Grouted Double Corrosion Protection Threadbar System comprising (see Note 1):
   a. Stressing and Non Stressing Anchorage: Square plate and domed anchor nut without grout slot;
   b. Coupling: Cylindrical coupling system type D;
   c. Hot-rolled ribbed bar sizes of 26, 32, 36 and 40 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.

Note:
1: Use limited to unbonded post-tensioning system.
Objective Id: A5660406
BTD 2008/11

Freyssinet Australia Pty Ltd

(1) Freyssinet C Range Multistrand Prestressing System comprising:
   a) Stressing (active) anchorages: Internal prestressing anchorages Type AnC15 using 3-piece wedges;
   b) Non-stressing (fixed) anchorages: Internal prestressing dead end anchorages Type DE comprising power seated 3-piece wedge and barrel assemblies on steel plates;
   c) Coupling: Couplers Type CI, comprising of staggered monostrand connectors of individual strands, for up to 37 strands;
   d) Ducts: Circular steel ducts zinc coated to AS1397 and HDPE Plyduct corrugated ducts;
   e) Tendon sizes of 3, 4, 7, 13, 19, 25, 31, 37 & 55 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2
      III. EN 10138-3-Y1867S7-15.7 Low Relaxation;
   f) Bursting reinforcement in accordance with Freyssinet Prestressing System - European Technical Approval ETA-06/0226 with some changes to suit reinforcement sizes in Australia. Refer to Freyssinet catalogue at the link below.

(2) Freyssinet Australia Slab System comprising:
   a) Stressing (active) anchorages: Stressing blocks with 2-piece wedges, except for anchorages of size 5S15 that comprise barrels and 2-piece wedges;
   b) Non stressing anchorages: Cast-in onion dead end with steel plates;
   c) Coupling: Coupler blocks;
   d) Ducts: Round and oval galvanised ducts;
   e) Tendon sizes of 2, 3, 4 and 5 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2

(3) Freyssibar System comprising:
   a) Stressing and non-stressing anchorages: Flat anchorage with standard plates, flat washers and nuts. The standard plates can be found in four different designs:
      I. FP: bearing plate;
      II. FPGH: bearing plate with injection slot;
      III. FPGHT: bearing plate with injection slot and welded tube;
      IV. FPGHTV: bearing plate with injection slot and welded tube fitted with injection inlet.
   b) Coupling: Moveable or fixed cylindrical couplers;
   c) Freyssibar nominal sizes of 26.5, 29, 32, 36, 40 and 50 mm diameters made of steel grade 1030 conforming to prEN 10138:2003 Parts 1 & 4;
   d) Ducts: Galvanised steel circular corrugated ducts;
   e) Bursting reinforcement in accordance with Freyssinet Prestressing System - European Technical Approval ETA 09/0169 with some changes to suit reinforcement sizes in Australia. Refer to Freyssinet catalogue at the link below.
SRG Limited

(1) SRG Limited Slab Post-Tensioning System comprising:
   a) Stressing anchorages: Anchor blocks on cast-in anchorage using 2-piece wedges;
   b) Non-stressing anchorages: Cast-in swaged type dead end on steel plate or bulb dead end;
   c) Coupling: Coupling anchorages, using 2-piece wedges for strands to be coupled and swaged ends for coupling strands;
   d) Ducts: Circular and flat steel sheet ducts zinc coated to AS1397;
   e) Tendon sizes of 1 to 5 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
      III. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2

(2) Macalloy Bar Prestressing System comprising:
   a) Stressing and Non Stressing anchorages: Flat stressing nut and washer on square steel anchor plate with an unthreaded hole;
   b) Coupling: Macalloy Couplers;
   c) Ribbed bar of 25, 26.5, 32, 36, 40 and 50 mm diameters as approved in ETA-07/0046;
   d) Ducts: Circular spiral steel sheet ducts zinc coated to AS1397;
   e) Bursting reinforcement in accordance with Annex C of ETA 07/0046.

(3) BBR Cona Multi Strand Post Tensioning System comprising:
   a) Stressing anchorage:
      I. Type M1 with up to 61 x 12.7 mm strands and up to 42 x 15.2 mm strands using 3-piece wedges
      II. Type M3 5506 fabricated with 55x15.2 mm strands using 3-piece wedges;
   b) Non-stressing anchorage:
      I. Type M1 with up to 61 x 12.7 mm strands and up to 42 x 15.2 mm strands using 3-piece wedges
      II. Cast-in swaged ends in steel plate with up to 61x12.7 mm strands and up to 55x15.2 mm strands;
   c) Coupling: Type K couplers for up to 31 x 12.7 mm strands and up to 42 x 15.2 mm strands;
   d) Ducts: Circular spiral steel sheet ducts zinc coated to AS1397;
   e) Tendon sizes of 1 to 5 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
      III. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2
4) BBR VT CONA CMI BT Prestressing System comprising:
   a) Fixed or stressing anchor head types A2 for 0206 to 3106 and A6 for 0206 to 6106;
   b) Fixed or stressing threaded anchor head type H2 from 0206 to 3106;
   c) Fixed or stressing single plane coupler type K from 0206 to 3106;
   d) Fixed or stressing sleeve coupler type H from 0206 to 3106;
   e) Bearing Trumplates BT spheroidal cast iron from 0206 to 6106;
   f) Ducts: Spiral steel sheet ducts - Refobar Australia, and PP plastic;
   g) Corrugated HDPE trumpet type K from 0206 to 3106 (for coupler);
   h) Corrugated HDPE trumpet type A from 0206 to 6106 (for anchorages);
   i) 3-piece wedge type H with steel spring ring;
   j) Y1860S7 strand to prEN I0138-3, 7 wire strand 15.3-140-1860-260 and 15.7-150-1860-279;
   k) Bursting reinforcement, system parameters, anchorage spacing and concrete strength in accordance with ETA-09/0286.

VSL Australia Pty Ltd

(1) VSL Type Sc Multistrand Prestressing System comprising:
   a) Stressing anchorage: Machined anchor heads with 90° spigot on cast-in square-faced castings using 2-piece wedges;
   b) Non-stressing anchorage: Cast-in Type P swaged ends on steel plate or Type H onion dead ends;
   c) Coupling: Type KAS Multistrand coupler heads with 90° spigot (see Note 1);
   d) Ducts: Circular corrugated galvanised ducts and corrugated plastic ducts VSL PT PLUS system;
   e) Tendon sizes of 7, 12, 19, 22, 27, 31, 37, 42, 48 & 55 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
      III. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2

Note:
1. Maximum coupled tendon size made up of 12.7 mm strands is 55x12.7 mm and maximum coupled tendon size made up of 15.2 mm strands is 31x15.2 mm.

(2) VSL Type Gc Prestressing System comprising:
   a) Active or passive end QT material anchor heads Type E for 1 to 55 strands;
   b) Non-stressing anchorage bonded anchorages Type H for 1 to 37 strands;
   c) Fixed coupler Type K for 3 to 37 strands;
   d) Spheroidal graphite cast iron Gc castings for 3 to 55 strands;
   e) Ducts: Corrugated galvanised steel sheet ducts and corrugated plastic ducts VSL PT PLUS;
   f) Sheet metal rolled K - trumpet for K couplers for 3 to 37 strands;
   g) Polypropylene trumpet with Gc castings for 19 to 55 strands;
h) 2-piece wedge Type W6N (for 15.2 mm diameter strand) or W6S (for 15.7 mm diameter strand) with or without clip;

i) 1770 MPa or 1860 MPa 7-wire strand of nominal diameter 15.2 or 15.7 mm to EN 10138;

j) Bursting reinforcement system design parameters, anchorage spacing and concrete strength in accordance with ETA-06/0006.

(3) VSL Slab System comprising:

a) Stressing anchorages: Anchor blocks on cast-in anchorage using 2-piece wedges;

b) Non stressing anchorages: Cast-in Type P swaged ends on steel plate or Type H onion dead ends;

c) Coupling: Slab coupling anchorages type S - using 2-piece wedges for strands to be coupled and swaged ends for coupling strands;

d) Ducts: Oval galvanised ducts and corrugated plastic ducts VSL PT PLUS system;

e) Tendon sizes of 1 to 5 strands of the following types and grades:

   I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2
   II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
   III. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2

(4) VSL CT Stressbar System comprising:

a) Stressing anchorages: Flat stressing nut and washer or spherical nut and washer on steel bearing plates;

b) Non stressing anchorages: Cast-in steel plate with threaded hole or a stressing anchorage;

c) Coupling: Machined cylindrical or hexagonal CT couplers;

d) Ducts: Circular corrugated galvanised ducts and corrugated plastic duct VSL PT PLUS system;

e) Bar sizes (see Note 1) of 20, 23, 26, 29, 32, 36, 40, 48, 56 and 75 mm diameter coarse threaded bars made of steel grade 4140 to AS 1444 with minimum tensile strength of 1030 MPa.


Note:
1. Details of the bars in terms of nominal cross-sectional area, nominal tensile strength, 0.1% proof force and minimum breaking load are as per Table 6.1 of AS/NZS 4672.1, or as specified for sizes not listed in the standard.

Rizzani de Eccher Australia Pty Ltd

(1) Tensacciai MTAI and MTAIM Prestressing System comprising:

a) Active anchorage types MTAI15 (15.2 strand) and MTAI15S (15.7 strand) for 4 to 37 strands;

b) Passive anchorage types MTAIM15 (15.2 strand) and MTAIM15S (15.7 strand) for 4 to 37 strands;

c) Spheroidal graphite cast iron block – Grade EN-GJS-500-7 for 4 to 37 strands;

d) Corrugated steel sheet duct to EN 523;

e) Corrugated HDPE trumpet;

f) 3-piece wedge with steel spring ring – Grade 16NiCr4 to EN 10084 or Grade C15 to EN 10277-2;
g) 1770 MPa or 1860 MPa 7-wire strand with diameters 15.2 mm or 15.7 mm to EN 100138 or approved equivalent;

h) Bursting and additional local anchorage reinforcement, system design parameters and anchorage spacing and concrete strength in accordance with ETA approval ETA-08/0012 version 3 of 23/01/2017.


Provisionally Approved Proprietary Post-Tensioning Systems

DSI Pty Ltd

(1) DSI MA Multistrand Post-Tensioning System comprising: (see Note 1)

a) Stressing anchorage: Anchor heads and multi plane MA bearing plates up to 55 strands using Type 36H (for diameter 15.2 mm strand) and 37H (for diameter 15.7 mm strand) 30/60 degrees teeth 3-piece wedges;

b) Non-stressing anchorage: Anchor heads and multi plane MA bearing plates up to 55 strands using Type 36H (for diameter 15.2 mm strand) and 37H (for diameter 15.7 mm strand) 30/60 degrees teeth 3-piece wedges or Type H bond anchorage up to 22 strands;

c) Ducts: Circular spiral steel sheet ducts zinc coated to EN523;

d) Tendon sizes of 5, 7, 9, 12, 15, 19, 22, 27, 31, 37, 43, 49 and 55 strands of the following types and grades:

   I. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
   II. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2
   III. EN 10138-3-Y 1867S7-15.7 Low Relaxation;

e) Bursting reinforcement details approved by RMS in accordance with DSI Prestressing System - European Technical Approval ETA-13/0815, which are included in DSI Technical Data Sheet that can be accessed at:


Note:
1. Roads and Maritime Services approval is required for DSI nominated post-tensioning system installer.

TECPRESA

(1) Tecpresa Multistrand Post-Tensioning System comprising:

a) Stressing anchorage - Anchor block and bearing plate welded to trumpet, using 3-piece wedges;

b) Non-stressing anchorage - Anchor block, bearing plate and plate welded to trumpet, using 3-piece wedges;

c) Coupling: Threaded couplers;

d) Ducts: Circular spiral steel sheet ducts zinc coated to AS1397 or EN 523, or plastic PT ducts;

e) Tendon sizes of 4, 7, 9, 12, 15, 19, 25, 31 and 37 strands of the following types and grades:

   I. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2
   II. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2
   III. EN 10138-3-Y 1860S7-15.7 Low Relaxation;
Objective Id: A5660406
BTD 2008/11

f) Bursting reinforcement details approved by RMS, which are included in Tecpresa Technical Data Sheet that can be accessed at:

6. Proprietary Grouting Systems
(Refer to RMS QA Specification B113)

Bluey Technologies Pty Ltd
   BluCem HS200G (BluCem HS200A + GP Cement) and BluCem HS200 (preblend) post-tensioning cable grouts

Freyssinet Australia Pty Ltd
   FreyssinetGrout

Sika Australia Pty Ltd
   SikaGrout® 300PT (au)

VSL Australia Pty Ltd
   VSL "optimised" grout.

7. Proprietary Ground Anchor Systems
(Refer to RMS QA Specification B114)

DSI Pty Ltd
(1) DSI Single Threadbar System comprising:
   (a) Stressing Anchorage: Square plate and domed anchor nut without grout slot;
   (b) Coupling: Cylindrical movable coupling system types D and G and fixed coupling system;
   (c) Hot-rolled ribbed bar sizes of 26, 32, 36 and 40 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.
(2) DSI Factory Grouted Double Corrosion Protection Threadbar System comprising:
   (a) Stressing Anchorage: Square plate and domed anchor nut without grout slot;
   (b) Coupling: Cylindrical coupling system type D;
   (c) Hot-rolled ribbed bar sizes of 26, 32, 36 and 40 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.

MacDonald Contracting Australia Pty Ltd
(1) Macdonald Contracting Multistrand system comprising:
   a) Anchor heads: Machined anchor heads with 90° spigot on square steel plates using 3-piece grooved wedges;
   b) Ducts: HDPE corrugated ducts;
   c) Tendon sizes of 2, 3, 4, 5, 7, 12, 19, 31 & 55 strands of the following type and grade:
VSL Australia Pty Ltd

(1) VSL Type Sc Multistrand System comprising:
   a) Anchor head: Machined anchor heads with 90° spigot on cast-in square-faced castings using 2-piece wedges;
   b) Ducts: HDPE PE 100 corrugated ducts;
   c) Tendon sizes of 7, 12, 19, 22, 27, 31, 37, 42, 48 & 55 strands of the following types and grades:
      I. AS/NZS 4672.1-7 wire ordinary-12.7-1870-Relax 2,
      II. AS/NZS 4672.1-7 wire ordinary-15.2-1750-Relax 2,
      III. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2.

(2) VSL CT Stressbar System comprising:
   a) Anchor head: Flat stressing nut and washer or spherical nut and washer on steel bearing plates;
   b) Coupling: Machined cylindrical or hexagonal CT couplers;
   c) Ducts: HDPE PE 100 corrugated ducts;
   d) Bar sizes (see Note 1) of 20, 23, 26, 29, 32, 36, 40, 48, 56 and 75 mm diameter coarse threaded bars made of steel grade 4140 to AS 1444 with minimum tensile strength of 1030 MPa.

Note:
1. Details of the bars in terms of nominal cross-sectional area, nominal tensile strength, 0.1% proof force and minimum breaking load are as per Table 6.1 of AS/NZS 4672.1, or as specified for sizes not listed in the standard.
### 8. Proprietary Mechanical Grade D500N Reinforcing Bar Splices

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ancon Building Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancon BT 12 to BT 40</td>
<td>12 to 40 mm</td>
<td>A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.</td>
</tr>
<tr>
<td>Ancon MBT ET12 to MBT ET36</td>
<td>12 to 36 mm</td>
<td>This coupler should be used only where the threaded type couplers cannot be used. The coupler relies on a row of screws tightened to hold the ends of reinforcement bars to be spliced and does not require bar end preparation.</td>
</tr>
<tr>
<td><strong>Liberty OneSteel Reinforcing Pty Ltd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dextra Griptec Standard Couplers</td>
<td>12 to 40 mm</td>
<td>A threaded type coupler extruded over the ends of the reinforcement bars to be spliced.</td>
</tr>
<tr>
<td>Dextra Unitec Bolted Couplers</td>
<td>20 to 36 mm</td>
<td>This coupler should be used only where the threaded type couplers cannot be used. The coupler relies on a row of screws tightened to hold the ends of reinforcement bars to be spliced and does not require bar end preparation.</td>
</tr>
<tr>
<td><strong>nVent – Erico Products Australia Pty Ltd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lenton Plus Standard Coupler EL16A2N to EL36A2N</td>
<td>16 to 36 mm</td>
<td>A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.</td>
</tr>
<tr>
<td>Lenton Plus Standard Coupler EL12A12N to EL40A12N</td>
<td>12 to 40 mm</td>
<td>A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.</td>
</tr>
<tr>
<td>Lenton Plus Position Coupler EL25P13LN to EL36P13LN</td>
<td>24 to 36 mm</td>
<td>A threaded type coupler, with an extension nut to avoid the need to rotate the splicing bar during installation.</td>
</tr>
<tr>
<td>Lenton Plus Position Coupler EL12P14LN to EL32P14LN</td>
<td>12 to 32 mm</td>
<td>A threaded type coupler, with an extension nut to avoid the need to rotate the splicing bar during installation.</td>
</tr>
<tr>
<td>Lenton Lock Couplers LL20B1 to LL36B1</td>
<td>20 to 36 mm</td>
<td>This coupler should be used only where the threaded type couplers cannot be used. The coupler relies on a row of screws tightened to hold the ends of reinforcement bars to be spliced and does not require bar end preparation.</td>
</tr>
</tbody>
</table>
9. Dynamic Testing of Piles
(Refer to RMS driven piles specifications)

Systems and Organisations
(a) Pile Driving Analyzer and CAPWAP Analysis (GRL USA)
   (i) Independent Geoscience Pty Ltd
   (ii) VicRoads (GeoPave)
   (iii) PILETEST P/L (a division of Wagstaff Piling)
   (iv) Golder Associates Pty Ltd
   (v) Frankipile Australia P/L (Sydney)
   (vi) Pile Test International
   (vii) Foundation Specialists Pty Ltd
   (viii) Advanced Foundation Solutions (Aust) Pty Ltd
   (ix) Dynamic Pile Testing Australia Pty Ltd
   (x) Piling Contractors Pty Ltd
   (xi) Ngamo Dynamics Pty Ltd
   (xii) Avopiling Australia Pty Ltd
(b) TNO Foundation Pile Diagnostic System and TNOWAVE Analysis (TNO Laboratories, Netherlands)
   (i) Frankipile Australia P/L (Sydney)
   (ii) Foundation Specialists Pty Ltd

Equipment
(a) Equipment
   (i) Pile Driving Analyzer manufactured by Pile Dynamics Inc
   (ii) Foundation Pile Diagnostic System (Version 3) manufactured by TNO Laboratories
(b) Wave Equation or Signal Matching Process Programs
   (i) CAPWAP supplied by Goble-Roche Laboratories (for Pile Driving Analyzer results)
   (ii) TNOWAVE supplied by TNO Laboratories (for TNO Foundation Pile Diagnostic System results)

10. Pile Splices
(Refer to RMS driven piles specifications)
(a) RTA(RMS) Epoxy Splicing System
(b) Balken Twist Lock Joint (350 x 350mm) manufactured and supplied by Wagstaff Piling Pty Ltd
(c) ABB Pile Joint (350 x 350mm with 4 clamping elements) supplied by Frankipile Australia Pty Ltd
(d) Dynamic Precast Pile Joint (350 x 350mm and 400 x 400mm with 8 clamping elements) supplied by Wagstaff Piling Pty Ltd
(e) BC Pile Joint (350 x 350mm and 400x400mm with 4 clamping elements) supplied by Frankipile Australia Pty Ltd
(f) AFS Joint (400 x 400mm with 4 clamping elements) supplied by Advanced Foundation Solutions (Aust) Pty Limited
Notes:
1. All pile splices listed above are mechanical splices except the splice in Item (a).
2. Mechanical pile splices have limited flexural and tensile strength, and may not be suitable for some applications. For information on short-term (during driving) and long-term design capacity of the above-mentioned pile splices, contact the Senior Bridge Engineer (Capability and Special Projects).

11. RMS Contact

For enquiries or information regarding submitting proprietary bridge components and systems for RMS approval in accordance with RMS Bridge Technical Direction BTD 2008/11, contact:

Senior Bridge Engineer (Capability and Special Projects)
RMS Bridge and Structural Engineering
PO Box 3035
Parramatta NSW 2124; DX 28343 Parramatta
Ph: 02 8837 0805