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Lists of Transport for NSW (TfNSW) Approved Bridge Components and Systems

1. Proprietary Bridge Expansion Joints

Company	Product Name	Joint Type
Freyssinet Australia	CIPEC WP Series steel fingerplate joints: WP250, WP300, WP350, WP400, WP450, WP500, WP550, WP600	Fingerplate (See Notes 1, 2 & 3)
Granor Rubber & Engineering	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	
mageba (Australia) Pty Ltd	TENSA Finger RSFD-B 140-AU	
Freyssinet Australia	CIPEC Wd110, Wd160, Wd230C	Saw tooth (See Notes 1, 2 & 3)
Granor Rubber & Engineering	ETIC: EJ-110, EJ-160, EJ200 and EJ250R ('R' indicates reduced maximum opening.)	
Freyssinet Australia	CIPEC WOSd 75 AUS-R CIPEC WOSd 100 AUS-R	Strip seal (See Note 1)
Granor Rubber & Engineering	Granor Ausflex: Type AC-AR with Chloroprene seal sizes75D, 100D, 125D and 100F	
	Watson Bowman Acme: Strip Seal	
mageba (Australia) Pty Ltd	TENSA Single Gap RS-B80	
Trelleborg Engineered Systems Australia	SSA100	
Evolution Civil Maintenance	Britflex BEJ (Rehabilitation of expansion joints only)	
Granor Rubber & Engineering	Watson Bowman Acme: Series WA and WG	Compression seal
Granor Rubber & Engineering	XJS System (Rehabilitation of small movement joints)	Small movement joints with elastomeric concrete nosing
Trelleborg Engineered Systems Australia	PHS (Polimer Header System) Rehabilitation of small movement joints with the maximum opening of 45 mm	

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Company	Product Name	Joint Type
Benzberg Pty Ltd	EMSEAL BEJS Joint (for rehabilitation work only)	Prefabricated seals (see Note 4)
Parchem	Emer-Seal: Fosroc Nitoseal SC820 (Type 1 sealant) Fosroc Nitoseal SC800 (Type 2 sealant) Parchem PU40 (Type 3 sealant) (Refer to TfNSW B312 for sealant type definition)	Cold applied sealant joints (see Note 5)

Notes:
1. Recess for anchors in top surface must be filled with approved sealant such as Parchem PU40 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. The use of elastomeric nosing must be reviewed by TfNSW.
5. 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 Director Engineering Bridges and Structures, TfNSW Advanced Technical Services.

2. Proprietary Bridge Bearings

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

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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 TfNSW relevant specifications and AS 5100.4.

3. Proprietary Bridge Deck Waterproofing Membranes to Specification TfNSW B343

Company	Product Name	Waterproofing System
GCP Applied Technologies	Eliminator System	Liquid applied membrane

Provisionally Approved Systems

Company	Product Name	Waterproofing System
Evolution Civil Maintenance	Pitchmastic PmB	Liquid applied membrane
Evolution Civil Maintenance	Britdex MDP	Liquid applied membrane
Hychem International Pty Ltd	RPM Belgium Matacryl® WPM	Liquid applied membrane

4. Proprietary Slip Resistant Coatings

Company	Product Name	Skid resistant coating
Cormac Metal Spray	Cormac TH604	Aluminium + ceramic oxide metal spray (see Note 1)

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 TfNSW 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.

Dywidag Systems International Construction Pty Ltd

(1) Dywidag 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, 40 and 47 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.

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(2) Dywidag 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, 40 and 47 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.

Note:
1: Use limited to unbonded post-tensioning system.

(3) Dywidag MA Multistrand Post-Tensioning System comprising

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

b) Non-stressing anchorage: Anchor heads and multi plane MA bearing plate up to 55 strands using 30/60 degrees teeth 3-piece wedges of Type 36H for diameter 15.2 mm strand and Type 37H for diameter 15.7 mm strand, 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. Ill. EN 10138-3-Y 1867S7-15.7 Low Relaxation;

e) Bursting reinforcement: TfNSW approved details including helix reinforcement in accordance with Dywidag Prestressing System - European Technical Assessment ETA-13/0815 available at:

https://www.dsicivil.com.au/fileadmin/downloads/global/construction/approvals/en/dsi-dywidag-eta-13-0815-post-tensioning-system-using-strands-en.pdf

Freyssinet Australia Pty Ltd

(1) Freyssinet C Range Multistrand Prestressing System comprising:

a) Stressing (active) and Non-stressing (fixed) anchorages: Type AnC15 using 3-piece wedges;

b) Non-stressing dead end anchorages (embedded in concrete):

I. Type DE comprising power seated 2-piece wedge and barrel assemblies on steel plate for 15.2 strands (tendon sizes of 3, 4, 7, 13, 19, 25, 31 & 37 strands);

II. Type DE comprising power seated 3-piece wedge and barrel assemblies on steel plate for 15.7 strands (tendon sizes of 3, 4, 7, 13, 19, 25, 31 & 37 strands);

III. Type DE comprising extruded Type 15D anchor swages on steel plate for 15.2 and 15.7 strands (tendon sizes of 3, 4, 7, 13, 19, 25, 31 & 37 strands);

IV. Type NB internal passive anchorage with extruded Type 15DC anchor swages for 15.2 and 15.7 strands;

c) Coupling:

I. Couplers Type CI, comprising of staggered monostrand connectors of individual strands, for up to 37 strands;

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II. Couplers Type CU, multistrand fixed couplers for tendon sizes of 3, 4, 7, 13, 19, 25, 31 & 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 available at:

https://www.freyssinet.com.au/sites/default/files/documents/freyssinet_prestressing_brochure_0.pdf

(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 available at:

https://www.freyssinet.com.au/sites/default/files/documents/freyssinet_prestressing_brochure_0.pdf

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;

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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 21/0054

(3) 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 available at:

https://www.bbrnetwork.com/fileadmin/userdaten/Zulassungen%20EU/CONA%20CMI%20intern/BBR_ETA-09-0286_CMI_BT_EN_Rev4_0419.pdf

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;

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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;

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e) Bar size (see Note 1) of 26 mm diameter coarse threaded bar made of steel grade 4140 to AS1444 with minimum tensile strength of 1030 MPa.

http://www.vsl-australia.com.au/about-us/publications

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) for4 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 15.7mm 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 available at:

http://www.tensainternational.com/sites/default/files/document/attached_file/tensa-post-tensioning.pdf

Provisionally Approved Proprietary Post-Tensioning Systems

MK4 WORLD WIDE S.L.

(1) MK4 Multistrand Post-Tensioning System comprising:

a) Stressing anchorage: MSA active anchor heads for 4 to 37 strands on cast-in casting using 3-piece MH6 wedges with an inclusion of PE deviator for strands 24 and above;

b) Non-stressing anchorage: MSA active anchor heads or MPA passive anchor heads for 4 to 37 strands on cast-in casting using 3-piece MH6 wedges with an inclusion of PE deviator for strands 24 and above;

c) Coupling: MCR sleeve couplers for 4 to 12 strands with threaded anchor heads and MCU single strand coupler for 4 to 37 strands;

d) Ducts: Corrugated galvanized steel sheet ducts or corrugated polypropylene (PP) plastic ducts with an additional transition sleeve in use between casting and duct for strands 24 and above;

e) Tendon sizes of 4, 5, 7, 9, 12, 15, 19, 24, 27, 31 and 37 strands of:

I. AS/NZS 4672.1 7-wire ordinary-15.2-1830-Relax 2;

II. 1770 MPa 7-wire strand of nominal diameter 15.2 or 15.7 mm to EN 10138;

III. 1860 MPa 7-wire strand of nominal diameter 15.2 or 15.7 mm to EN 10138;

f) For tendons comprising of 24 strands and above, the bursting reinforcement to be provided shall be in accordance with ETA-12/0310 for a concrete strength of 25 MPa.

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For tendons comprising of up to 19 strands, the bursting reinforcement to be provided shall be in accordance with ETA-12/0310 for concrete strengths of 25 MPa and 45 MPa as appropriate. ETA-12/0310 is available at:

https://s3-ap-southeast-2.amazonaws.com/assets.fortecaustralia.com.au/app/uploads/2021/05/13124818/113736_ETA_MK4_MCA_9_en_dc.pdf

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;

f) Bursting reinforcement: TfNSW approved details are shown in Tecpresa Technical Data Sheet available at:

https://www.ferrovial.com/wp-content/uploads/2020/05/bursting-reinforcement-to-be-used-in-rms-projects-ed-1-2.pdf

6. Proprietary Grouting Systems

(Refer to TfNSW QA Specification B113)

Bluey Technologies Pty Ltd

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

Crosbe

Crosbe InfraGrout® 110

Freyssinet Australia Pty Ltd

FreyssinetGrout

Sika Australia Pty Ltd

SikaGrout® 300PT (au)

VSL Australia Pty Ltd

VSL “optimised” grout.

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7. Proprietary Ground Anchor Systems

(Refer to TfNSW QA Specification B114)

Dywidag Systems International Construction Pty Ltd

(1) Dywidag 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, 40 and 47 mm diameters to AS/NZS 4672 with minimum tensile strength of 1050 MPa.

(2) Dywidag 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, 40 and 47 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:

I. AS/NZS 4672.1-7 wire ordinary-15.2-1830-Relax 2

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 size (see Note 1) of 26 mm diameter coarse threaded bar 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.

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8. Proprietary Mechanical Grade D500N Reinforcing Bar Splices

Product Name	Size	Comments
Ancon Building Products trading as Leviat		
Ancon BT 12 to BT 40	12 to 40 mm	A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.
Ancon MBT ET12 to MBT ET36	12 to 36 mm	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.
InfraBuild Construction Solutions		
Dextra Griptec Standard Couplers	12 to 40 mm	A threaded type coupler extruded over the ends of the reinforcement bars to be spliced.
Dextra Unitec Bolted Couplers	20 to 36 mm	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.
nVent – Erico Products Australia Pty Ltd		
Lenton Plus Standard Coupler EL16A2N to EL36A2N	16 to 36 mm	A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.
Lenton Plus Standard Coupler EL12A12N to EL40A12N	12 to 40 mm	A threaded type coupler that requires threading of the ends of reinforcement bars to be spliced.
Lenton Plus Position Coupler EL12P13LN to EL40P13LN	12 to 40 mm	A threaded type coupler, with an extension nut to avoid the need to rotate the splicing bar during installation.
Lenton Plus Position Coupler EL12P14LN to EL40P14LN	12 to 40 mm	A threaded type coupler, with an extension nut to avoid the need to rotate the splicing bar during installation.
Lenton Lock Couplers LL20B1 to LL36B1	20 to 36 mm	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.

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9. Dynamic Testing of Piles

(Refer to TfNSW 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)

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10. Pile Splices

(Refer to TfNSW driven piles specifications)

(a) RTA(TfNSW) 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 Director Engineering Bridges and Structures.

11. TfNSW Contact

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

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