

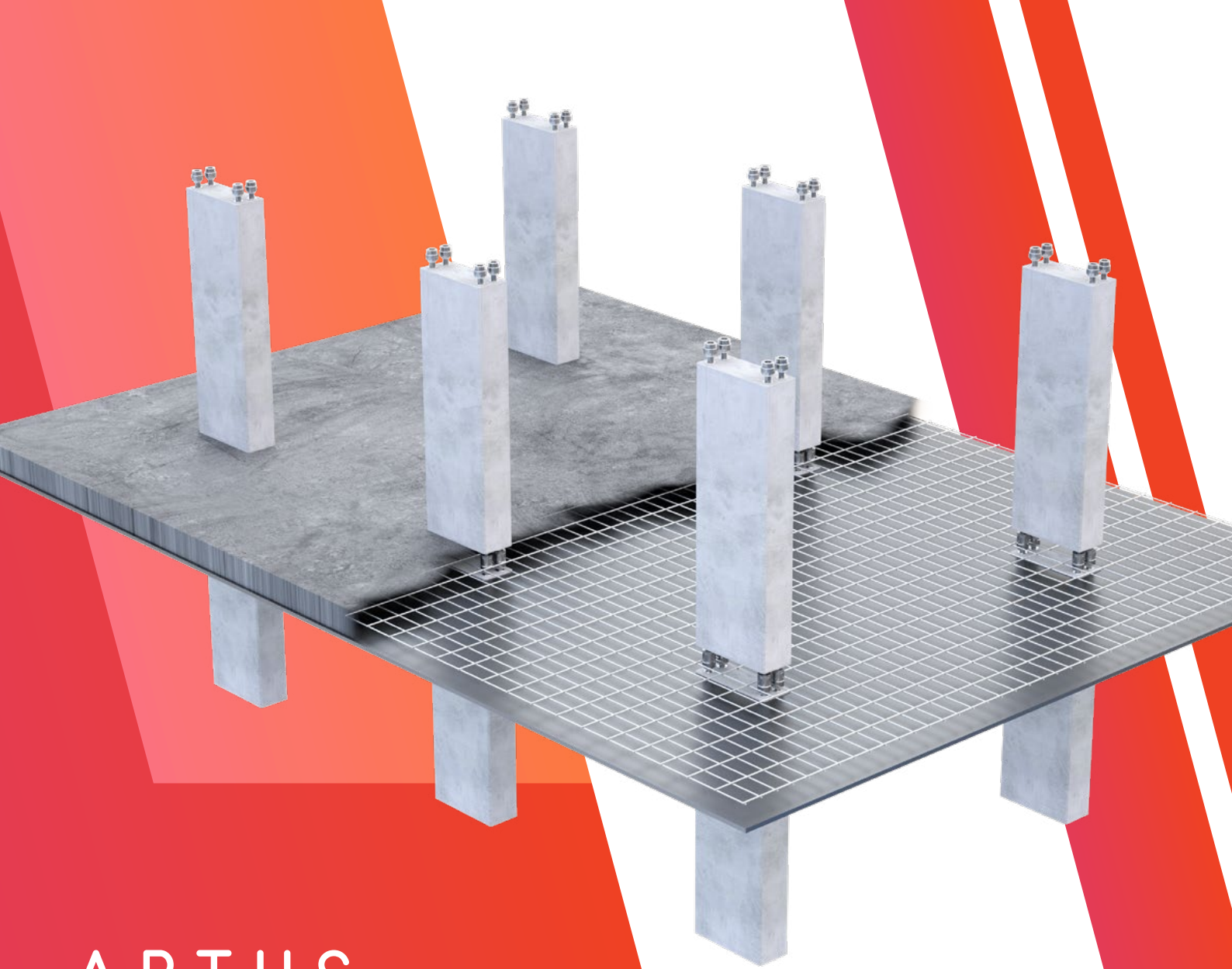


APTUS[®]

concrete connections



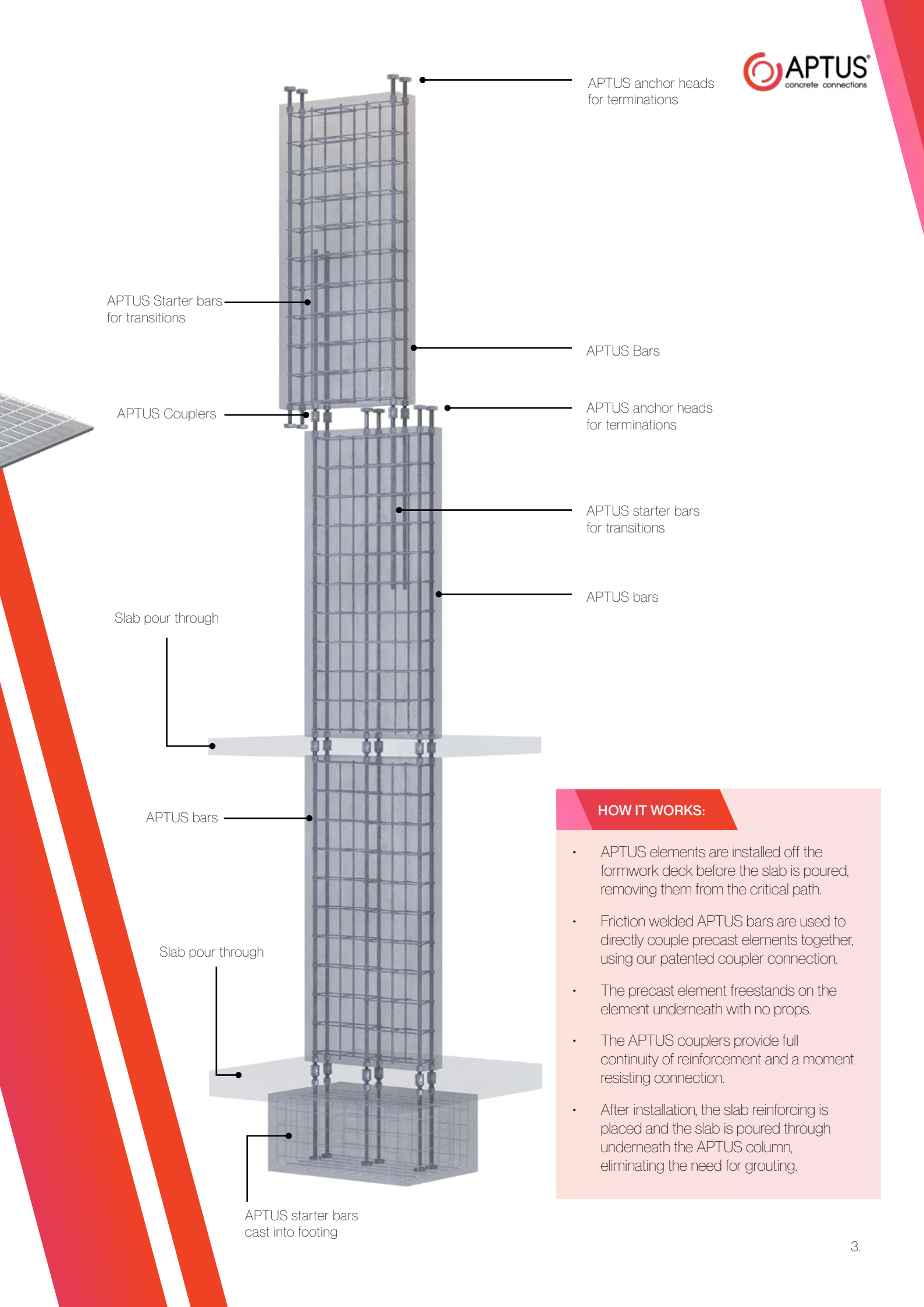
AUGUST 2023



APTUS ADVANTAGE

Effectively moves the construction of vertical elements off the critical path. Substantially reduces construction cycle times with patented technology.

- ⌚ No propping, no grouting, no further work required after installation
- ⌚ Faster, safer and more efficient way to design & construct
- ⌚ Easy to manufacture, easy to install
- ⌚ Removes an entire series of in situ trades associated with vertical elements - steel fixers, form workers, concreters, etc.
- ⌚ Provides unimpeded access for installation of horizontal formwork.
- ⌚ Provides electrical conductivity for lightning protection systems
- ⌚ Reduction in the number of crane movements & on-site storage of formwork, props, etc.
- ⌚ Enhances site safety removing congestion and clutter



APTUS Starter bars
for transitions

APTUS Couplers

Slab pour through

APTUS bars

Slab pour through

APTUS starter bars
cast into footing

APTUS anchor heads
for terminations

APTUS Bars

APTUS anchor heads
for terminations

APTUS starter bars
for transitions

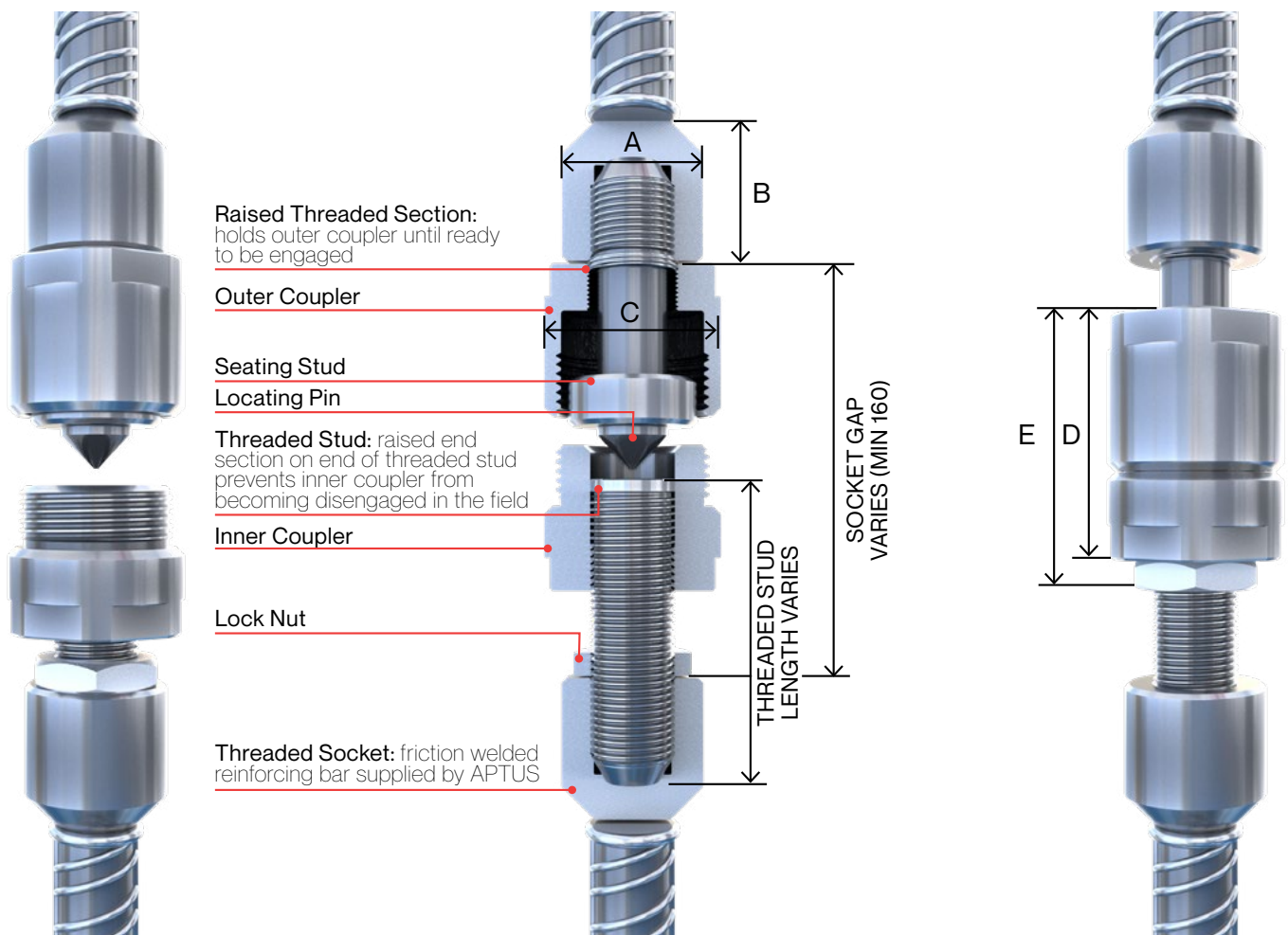
APTUS bars

HOW IT WORKS:

- APTUS elements are installed off the formwork deck before the slab is poured, removing them from the critical path.
- Friction welded APTUS bars are used to directly couple precast elements together, using our patented coupler connection.
- The precast element freestands on the element underneath with no props.
- The APTUS couplers provide full continuity of reinforcement and a moment resisting connection.
- After installation, the slab reinforcing is placed and the slab is poured through underneath the APTUS column, eliminating the need for grouting.

THE APTUS COUPLER

The APTUS coupler is a patented connection system, comprising of carefully designed individual parts that combine together to provide a robust 'bar break' system, which exceeds the capacity of regular 500N reinforcing bar.

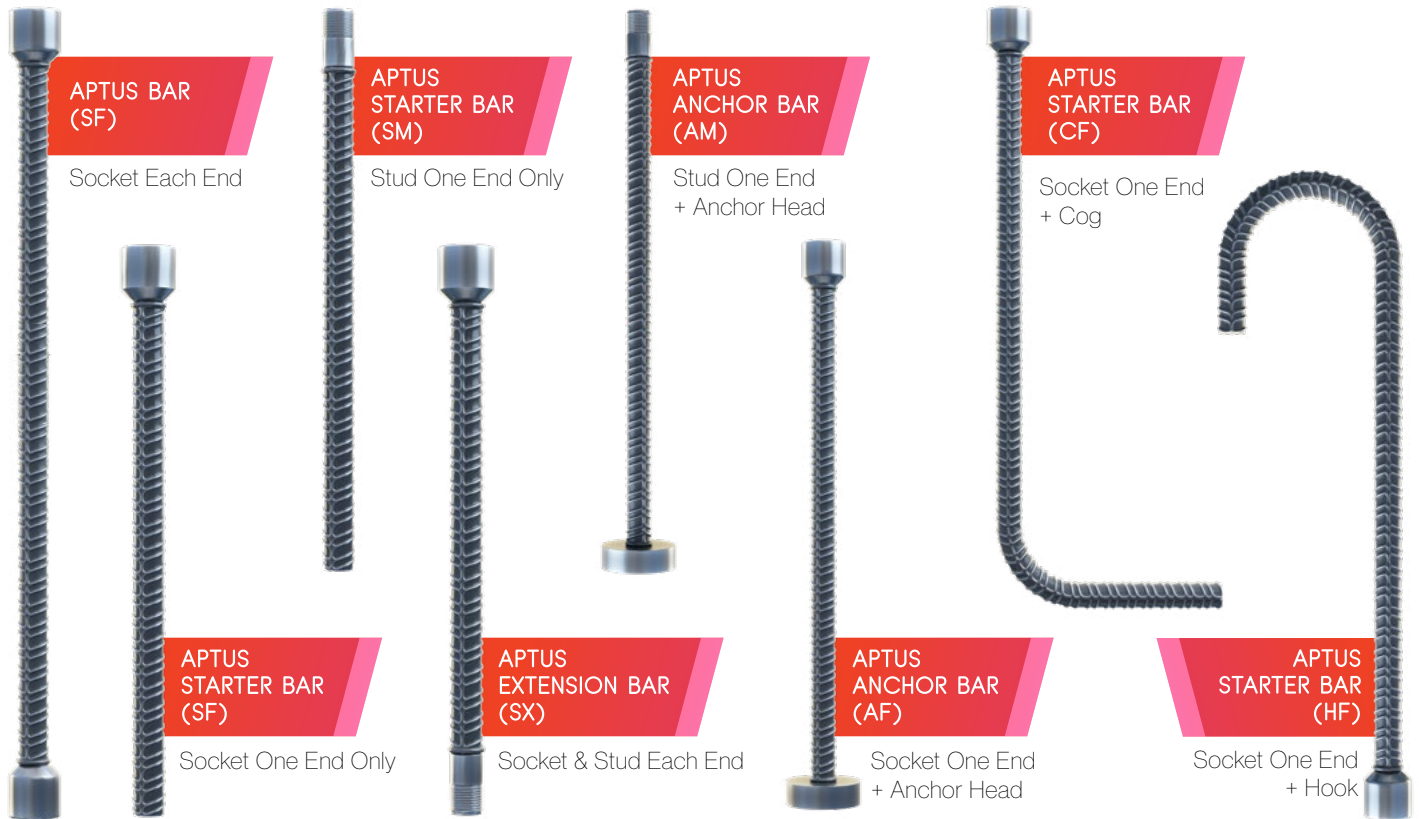


APTUS Couplers are supplied in **three** sizes to suit **six** reinforcing bar sizes. Intermediate bar sizes use the next size up coupler.

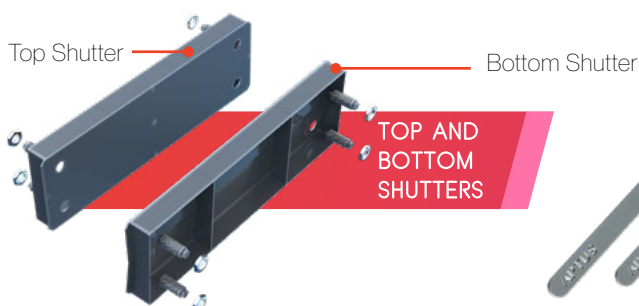
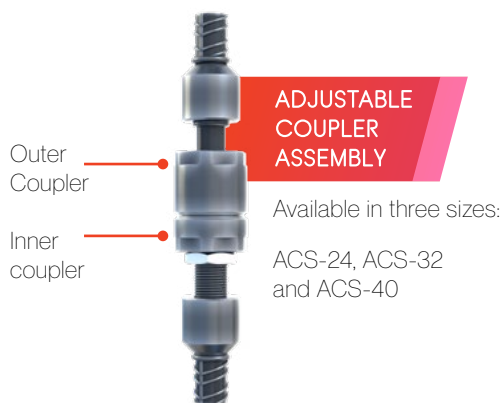
Coupler Size	Bar Diameter	Dimensions (mm)				
		A	B	C	D	E
ACS-24	N20/N24	50	45	65	102	114
ACS-32	N28/N32	60	60	75	102	114
ACS-40	N36/N40	75	70	85	102	114

APTUS components are manufactured from grade 4140 high tensile steel, minimum yield strength of 930 MPa.

WHAT APTUS SUPPLIES

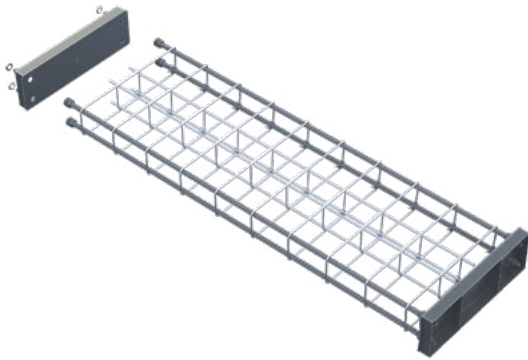
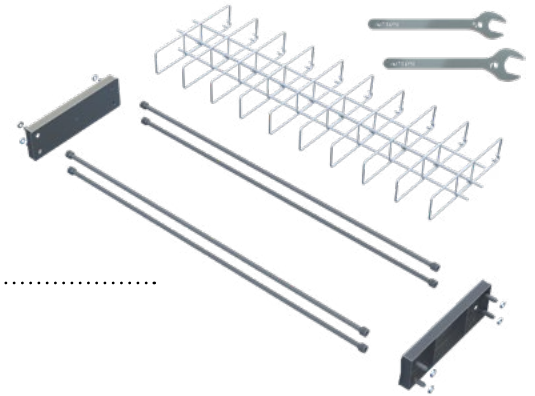


All APTUS bars available in: N20, N24, N28, N32, N36 and N40.

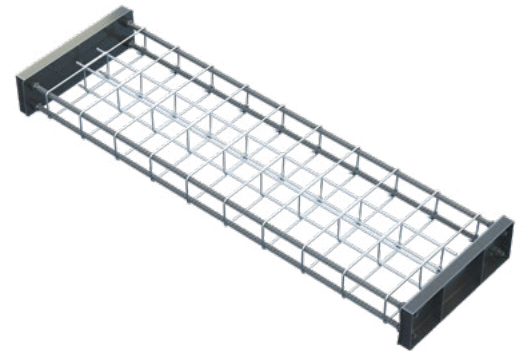


FABRICATION PROCESS

- The APTUS bars, end shutters and fabrication ancillaries are supplied by APTUS
- All other reinforcement is supplied by the precaster (including the non-aptus vertical bars and ligatures)



- The APTUS bars are bolted to the bottom shutter first, then the ligatures are slid over the APTUS bars and non-Aptus bars.



- All APTUS bars **must** be bolted to the supplied steel end shutters to ensure accurate bar position is maintained during the pour, and the APTUS couplers align on-site.



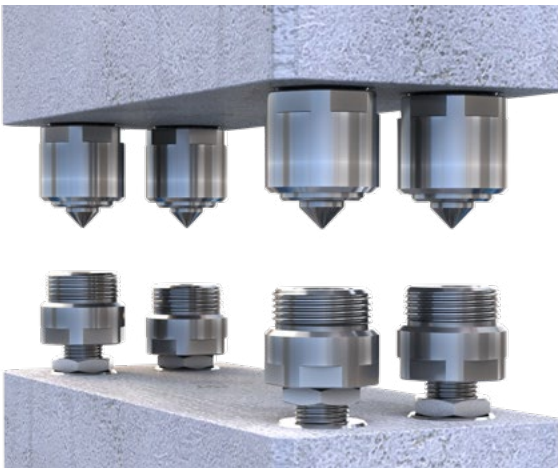
- Side shutters are clamped into position, and the element is poured.

- Once the concrete has cured, the shutters and bolts are removed. All required componentry (APTUS inner couplers, outer couplers, anchor heads) are fixed to the element in the factory **prior** to dispatch to site.



INSTALLATION

APTUS elements are typically installed in less than 10 minutes, with no further works required after install. All APTUS elements must be installed by an APTUS trained rigger. Contact us to arrange training for your rigging crew.



- Outer couplers are installed at the bottom of the element prior to leaving the factory.
- The outer couplers are raised to expose the seating studs and locating pins.
- The inner couplers at the top of the element under are set to the correct RL prior to install.



- The APTUS element is landed and three couplers are engaged to form a 3-legged stool (while the element is still supported by the crane).
- Any remaining couplers are wound down and not engaged during the plumbing process.
- The element is plumbed in both directions, by winding the engaged couplers up and down on the threaded stud.

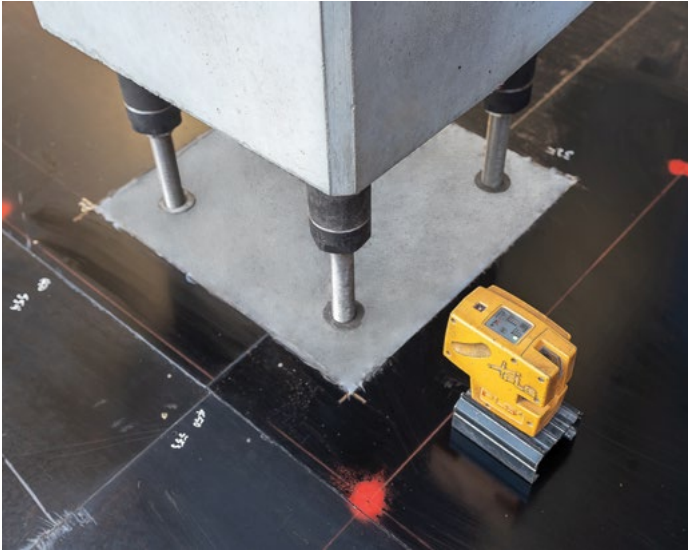


- Once the element is plumbed, the remaining couplers are engaged.
- All couplers and lock nuts are then tightened (snug tight) using APTUS spanners.
- The crane hook is then released and the element is freestanding.

PROJECT PHOTOS



PROJECT PHOTOS



FREQUENTLY ASKED QUESTIONS

How many projects has APTUS been used in?

APTUS has been used in over 50 projects around Australia. We have completed projects in Queensland, New South Wales, Victoria and Western Australia.

What sizes are available?

APTUS Couplers are manufactured in three sizes, N24, N32 and N40. APTUS Bars are manufactured in six sizes: N20, N24, N28, N32, N36 and N40. For an element that has a specified APTUS bar size that does not have a coupler (i.e. N20, N28 and N36), the coupler used will be the next size up.

What grade of material are the couplers manufactured from?

The couplers and components are manufactured from 4140 High Tensile Steel with a minimum yield strength of 930 MPa.

How do I get APTUS on my project?

Get in touch with us! Send through a package of structural and architectural drawings. APTUS has an in-house team of highly experienced structural engineers who will prepare a preliminary APTUS design for your project for free. This proposed design is then reviewed and approved by the project structural engineer prior to shop detailing.

How are APTUS shop drawings produced?

We recommend all APTUS shop drawings are produced in 3D (REVIT or Tekla) by the precaster's usual shop detailer. APTUS also has our own in-house drafting team which can provide support and produce drawings for the precaster.

Who is responsible for the permanent case design certification of APTUS elements?

Our team of engineers will propose a preliminary design for each project, however the permanent case design certification will always remain the responsibility of the project structural engineer.

Who is responsible for the temporary case design certification of APTUS elements?

APTUS provides certification for the temporary state to the builder free of charge.

I am a structural engineer, how I do check an APTUS element for the permanent case?

The capacity of an APTUS element is checked in exactly the same way as any other reinforced concrete column or wall, noting that all strength and stability checks should use the coupled APTUS bars only. Vertical non-APTUS bars are used to limit bar spacing for crack control and to provide a confinement matrix for ligatures.

Do APTUS Couplers comply with AS 3600:2018 Concrete Structures design code?

Yes, APTUS complies with the strength and slip requirements of clause 13.2.6 of AS 3600:2018 relating to welded or mechanical splices tested in accordance with ISO 15835-1:2018. APTUS has also obtained independent technical approval from ACRS, the Australasian Certification Authority for Reinforcing and Structural Steels.

What construction tolerances are built into the coupler?

The design of the couplers provides 30mm of vertical tolerance (+/-15mm) and 6mm of lateral tolerance (+/-3mm).

At what point in the project timeline can I place an order?

APTUS orders can only be made once the shop drawing for an element has been Issued for Construction (IFC). The APTUS bars are manufactured to the exact dimension noted on the shop drawing.

How do I make an order?

All orders must be placed online via our APTUS Online Ordering Tool. Our team will talk you through this as your project progresses.

What is the lead time for APTUS couplers?

Our standard operating timeline for delivery to a precast manufacturer is three weeks from date of order. We endeavour to beat this at all times, however this lead time should be used for planning purposes.

APTUS BARS						
BAR TYPE AND DESCRIPTION	N20	N24	N28	N32	N36	N40
APTUS BAR (SF) Socket each end	SB-N20-SF-2424	SB-N24-SF-2424	SB-N28-SF-3232	SB-N32-SF-3232	SB-N36-SF-4040	SB-N40-SF-4040
APTUS STARTER BAR (SF) Socket one end only	SB-N20-SF-0024	SB-N24-SF-0024	SB-N28-SF-0032	SB-N32-SF-0032	SB-N36-SF-0040	SB-N40-SF-0040
APTUS STARTER BAR (SM) Stud one end only	SB-N20-SM-0024	SB-N24-SM-0024	SB-N28-SM-0032	SB-N32-SM-0032	SB-N36-SM-0040	SB-N40-SM-0040
APTUS EXTENSION BAR (SX) Socket & stud each end	SB-N20-SX-2424	SB-N24-SX-2424	SB-N28-SX-3232	SB-N32-SX-3232	SB-N36-SX-4040	SB-N40-SX-4040
APTUS ANCHOR BAR (AM) Stud one end & Anchor head	SB-N20-AM-2420	SB-N24-AM-2424	SB-N28-AM-3232	SB-N32-AM-3232	SB-N36-AM-4040	SB-N40-AM-4040
APTUS ANCHOR BAR (AF) Socket one end & Anchor head	SB-N20-AF-2420	SB-N24-AF-2424	SB-N28-AF-3232	SB-N32-AF-3232	SB-N36-AF-4040	SB-N40-AF-4040
APTUS STARTER BAR (CF) Socket one end & Cog	SB-N20-CF-0024	SB-N24-CF-0024	SB-N28-CF-0032	SB-N32-CF-0032	SB-N36-CF-0040	SB-N40-CF-0040
APTUS STARTER BAR (HF) Socket one end & Hook	SB-N20-HF-0024	SB-N24-HF-0024	SB-N28-HF-0032	SB-N32-HF-0032	SB-N36-HF-0040	SB-N40-HF-0040

Note: APTUS Bar Series - Standard bar configurations shown above, transition requirements using different APTUS socket sizes can be adopted to any size rebar.

APTUS SLIMLINE SERIES							
BAR TYPE AND DESCRIPTION	N16	N20	N24	N28	N32	N36	N40
APTUS SLIMLINE STARTER BAR - (SF) Socket one end only	SS-N16-SF-0016	SS-N20-SF-0020	SS-N24-SF-0024	SS-N28-SF-0028	SS-N32-SF-0032	SS-N36-SF-0036	SS-N40-SF-0040
APTUS SLIMLINE STARTER BAR - (SM) Stud one end only	SS-N16-SM-0016	SS-N20-SM-0020	SS-N24-SM-0024	SS-N28-SM-0028	SS-N32-SM-0032	SS-N36-SM-0036	SS-N40-SM-0040
APTUS SLIMLINE EXTENSION BAR (SX) Socket one end + Stud one end	SS-N16-SX-1616	SS-N20-SX-2020	SS-N24-SX-2424	SS-N28-SX-2828	SS-N32-SX-3232	SS-N36-SX-3636	SS-N40-SX-4040

Note: APTUS Slimline Bar Series - Standard bar configurations shown above, transition requirements using different APTUS Slimline socket sizes can be adopted to any size rebar.

APTUS INNER COUPLER ASSEMBLIES		
ACS-24	ACS-32	ACS-40
SA-24IC55-92	SA-32IC65-107	SA-40IC75-107
SA-24IC55-112	SA-32IC65-127	SA-40IC75-127
SA-24IC55-142	SA-32IC65-157	SA-40IC75-157
SA-24IC55-172	SA-32IC65-187	SA-40IC75-187
SA-24IC55-202	SA-32IC65-217	SA-40IC75-217
SA-24IC55-232	SA-32IC65-247	SA-40IC75-247
SA-24IC55-262	SA-32IC65-277	SA-40IC75-277
SA-24IC55-292	SA-32IC65-307	SA-40IC75-307
SA-24IC55-322	SA-32IC65-337	SA-40IC75-337
SA-24IC55-352	SA-32IC65-367	SA-40IC75-367
SA-24IC55-382	SA-32IC65-397	SA-40IC75-397
SA-24IC55-412	SA-32IC65-427	SA-40IC75-427

Note: Inner Coupler Assemblies include a inner coupler, threaded stud and a lock nut screwed together.

APTUS ANCHOR HEAD ASSEMBLIES		
ACS-24	ACS-32	ACS-40
SA-24AH28-112	SA-32AH36-127	SA-40AH45-127
SA-24AH28-142	SA-32AH36-157	SA-40AH45-157
SA-24AH28-172	SA-32AH36-187	SA-40AH45-187
SA-24AH28-202	SA-32AH36-217	SA-40AH45-217
SA-24AH28-232	SA-32AH36-247	SA-40AH45-247
SA-24AH28-262	SA-32AH36-277	SA-40AH45-277
SA-24AH28-292	SA-32AH36-307	SA-40AH45-307
SA-24AH28-322	SA-32AH36-337	SA-40AH45-337
SA-24AH28-352	SA-32AH36-367	SA-40AH45-367
SA-24AH28-382	SA-32AH36-397	SA-40AH45-397
SA-24AH28-412	SA-32AH36-427	SA-40AH45-427

Note: Anchor Head Assemblies include on anchor head, and a threaded stud screwed together.

APTUS SPANNERS & WRENCHES				
CODE	DESCRIPTION	ACS-24	ACS-32	ACS-40
SPA-40	INSTALLATION SPANNER - 40 mm	X		
SPA-50	INSTALLATION SPANNER - 50 mm		X	
SPA-60	INSTALLATION SPANNER - 60 mm	X		X
SPA-70	INSTALLATION SPANNER - 70 mm		X	
SPA-80	INSTALLATION SPANNER - 80 mm			X
HPW-300	HAWK PIPE WRENCH - 300 mm	X	X	X
HPW-350	HAWK PIPE WRENCH - 350 mm			X

Note: The factory and installation team will need all spanners and wrenches marked with an X for each coupler size.

APTUS BOLTS AND NUTS			
DESCRIPTION	ACS-24	ACS-32	ACS-40
60mm Bolts	60HS28	60HS36	60HS45
100mm Bolts	100HS28	100HS36	100HS454
150mm Bolts	150HS28	150HS36	150HS45
Lock Nuts	24LN28	32LN36	40LN45

APTUS OUTER COUPLER ASSEMBLIES		
ACS-24	ACS-32	ACS-40
SA-24OC55	SA-32OC65	SA-40OC75

Note: Outer Coupler Assemblies include a seating stud and an Outer Coupler screwed together.



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www.APTUS.systems