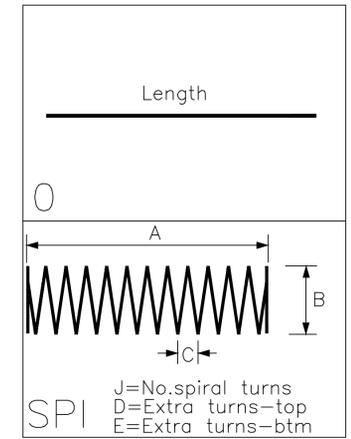
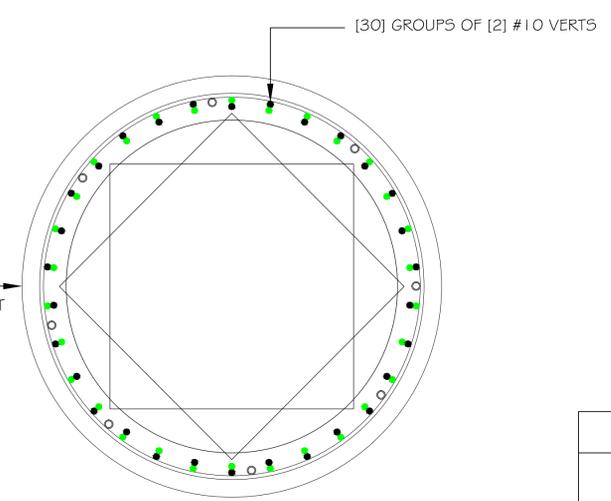
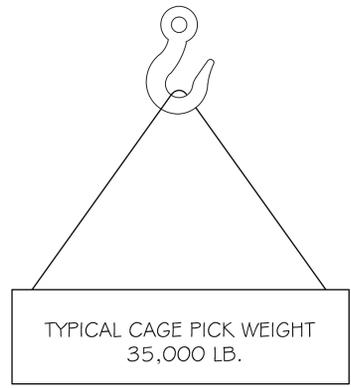
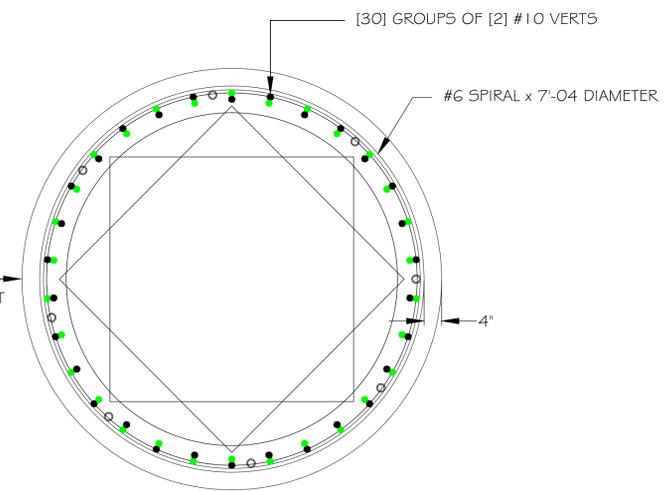
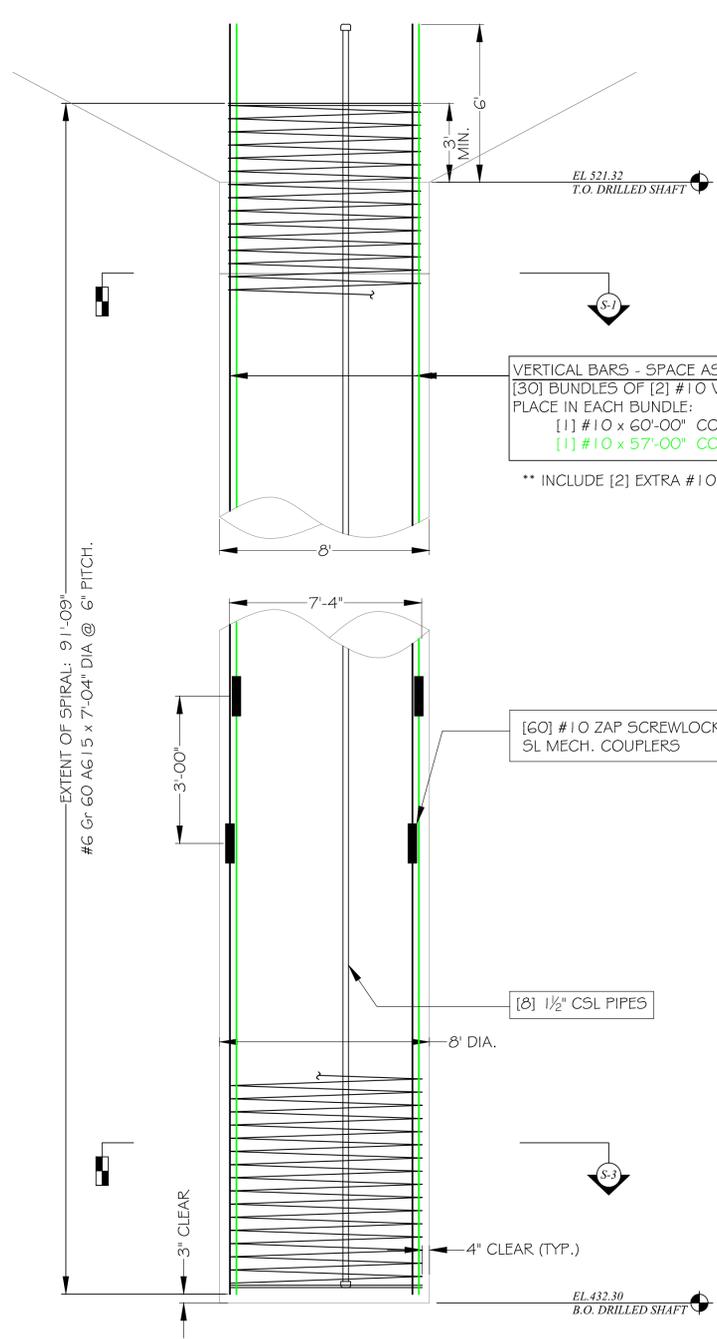


Release Number:				BAR LIST												
Bar Mark	Qty	Size	Total Length	Type	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'	'O'	'R'
	30	#10	60'-0"			60'-0"										
	30	#10	57'-0"			57'-0"										
	32	#10	34'-9"			34'-9"										
	30	#10	37'-9"			37'-9"										
GDO1	5	#6	923'-7"	SPI	18'-5"	7'-4"	0'-6"	1.5	1.5				40.0			

- General Notes
1. ALL REBAR INCLUDED ON THIS DRAWING SHALL BE OF ASTM A615 GRADE 60 REBAR.
  2. COVER OF REINFORCEMENT TO BE 4" UNLESS OTHERWISE NOTED.
  3. DRAWING NOT TO SCALE
  4. ELEVATIONS ARE FOR INFORMATIONAL PURPOSES ONLY.
  5. DRAWING NOT TO SCALE



DESIGNER CERTIFICATION	CONTRACTOR APPROVAL

6			
5			
4			
3			
2			
1			
	DATE	REV.#	SENT FOR
	2000 7TH STREET SCOTIA, N.Y. 12302 PH: (518) 374-1936 FAX (518) 374-4830 www.dimensionfabricators.com		
STRUCTURE	BRIDGE 16 DS CAGE		
LOCATION	VTAOT RUTLAND BRF 3000 (16) RUTLAND, VT		
ARCHITECT			
ENGINEER			
CUSTOMER	KUBRICKY CONST. CORP.		
DRAWN BY	DATE	DFI #	
GBS	01/06/15		
DRAWING COVERS		DRAWING #	
		A-01-01	

# Zap Screwlok®



**BarSplice**  
PRODUCTS INC.  
SUBSIDIARY OF FC INDUSTRIES, INC.

# ZAP SCREWLOK

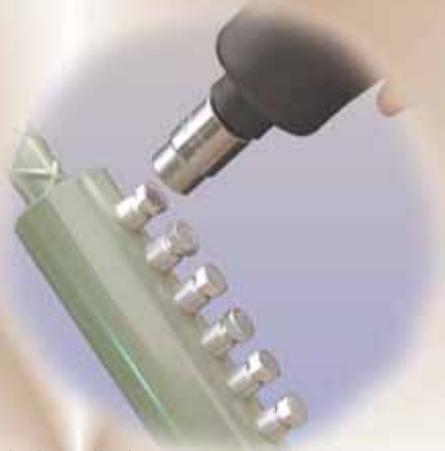
## MECHANICAL SPLICES

### SHEAR SCREW & WEDGE COUPLING SLEEVES



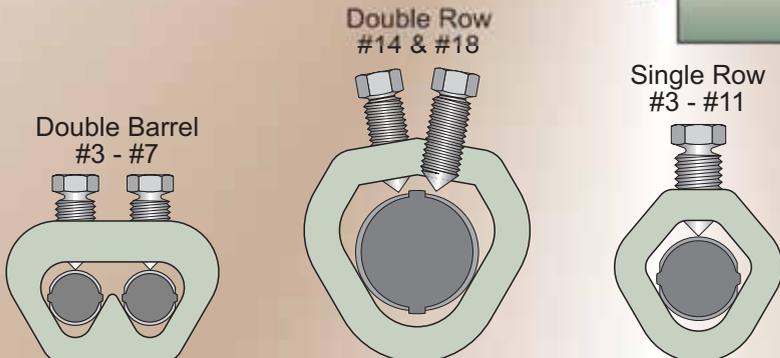
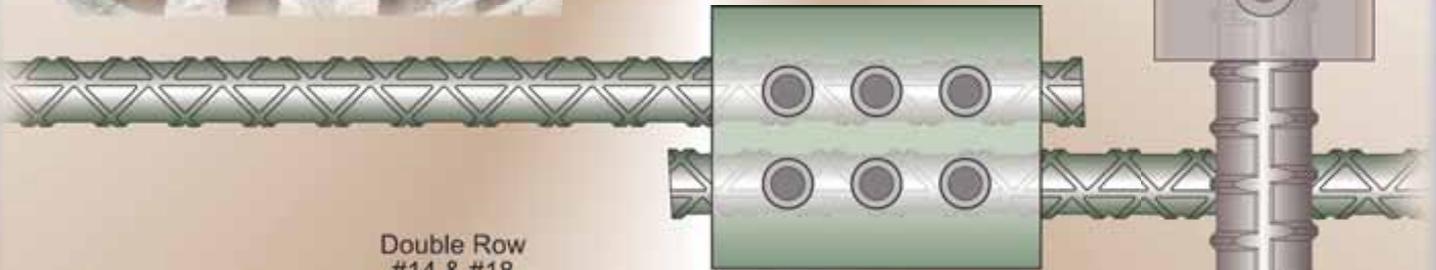
#### APPLICATIONS

- ✓ Retrofit or repair existing structures
- ✓ Eliminate expensive rebar-welds.
- ✓ Extend deck steel to widen bridges.
- ✓ Highway patch and repair projects.
- ✓ Connect bars across closure pours.
- ✓ In reinforced concrete piles and columns.

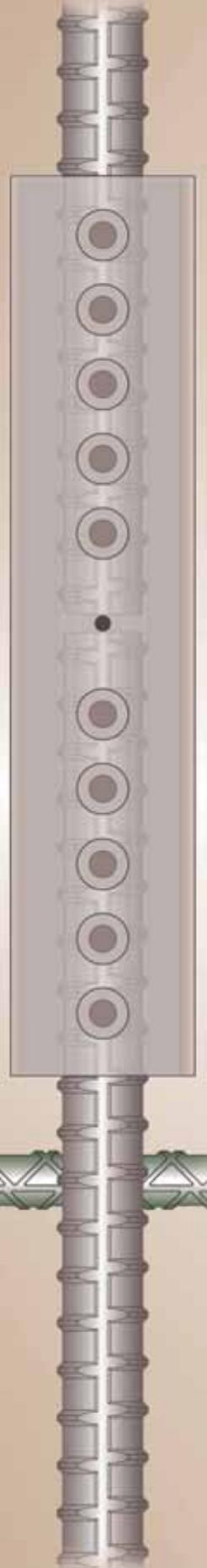


#### Simple installation...

Depending upon the size, assemble manually with socket wrench or for quickest installation, use a standard air impact wrench. By following the instructions supplied with your order, tighten the screws until the heads twist off at a prescribed value. The force from the screws causes the rebar deformations to interlock within the coupler. The screws embed themselves into the rebar surface. This dual mechanical action results in a full positive connection for transferring tension or compression force from bar-to-bar.



Force from the screws causes rebar deformations to interlock within the coupler wedge. At the same time, the screws embed themselves into the rebar surface and then the heads TWIST OFF.



# ZAP SCREWLOK® Mechanical Splices and Connectors for Reinforcing Bars – Review...

**ZAP SCREWLOK®** mechanical splices and connectors are compatible with reinforcing bars that comply with ASTM A 615, ASTM A 706, ASTM A 996, or equal and consist of smooth, shaped, steel sleeves with converging sides. A series of cone-pointed hex-head screws are arranged along the longitudinal axes in one or two rows. In the case of butt splices, reinforcing bars are inserted from each end to a center stop. No special bar-end preparation is required, so ends can be sheared, sawed, or flame-cut. *Assembly instructions are normally supplied with your order or can otherwise be obtained directly from Barsplice Products, Inc.*

**During mechanical splice assembly**, as screws are tightened, they embed themselves into the rebar surface and then the heads twist off at a prescribed tightening torque. Force from the screws causes rebar deformations to interlock within the coupler wedge. The DUAL mechanical action, results in a full positive connection for transferring tension or compression forces from bar-to-bar. Screws can be tightened using suitable impact wrenches or hand-held ratchet wrenches. Linear alignment is preserved across the splice by using reinforcing bars with straight ends and securing the continuation bar in the desired position at the time of assembly.

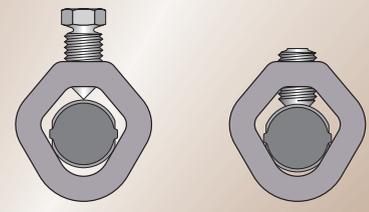
**When making splices between fixed points**, a coupler sleeve without a center stop can be slipped entirely onto one bar and subsequently repositioned over the two bar ends being spliced.

**Mechanical butt splices** and connectors are available for reinforcing bar sizes No. 3 through 18 (Ø10 through 57 mm) per BPI's **Dimensions and Data** charts. Transition splices are used to connect rebars of different sizes.

**Mechanical lap splices** are available for bar sizes No. 3 through 7 (Ø10 through 22 mm).

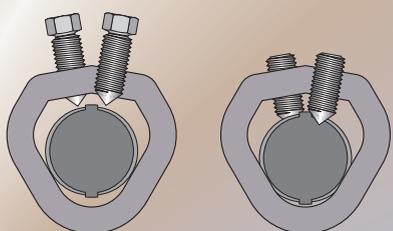
Single Row  
#3 - #11

**BEFORE  
AND  
AFTER  
ASSEMBLY**



Double Row  
#14 & #18

**BEFORE  
AND  
AFTER  
ASSEMBLY**



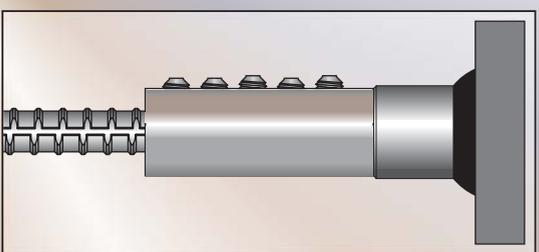
**Epoxy-coated steel** reinforcing bars that comply to ASTM A 775/A 775M can be spliced by means of epoxy coated coupling sleeves without shielding or removing the epoxy coating from the bar. Zinc coated (galvanized) bars can be mechanically spliced by means of galvanized coupling sleeves. Different types of ZAP SCREWLOK® mechanical splices are selectable for new construction, field repair applications, and the splicing of older types of reinforcing bars.

**ZAP SCREWLOK®** is a **positive tension and compression** mechanical splice system whose strength is independent of the concrete which surrounds it, thereby providing true structural continuity. Applications include heavy construction, field splicing of column steel, beam reinforcement, concrete piles and deck steel. The system is used for rehab projects, retrofit, strengthening, and up-grading concrete elements. Type 2 splices are used for mechanically splicing reinforcement in members resisting earthquake induced forces. Other uses may include extending deck steel to widen bridges, highway patch and repair projects and splicing of bars across closure pours.

**Benefits to using ZAP SCREWLOK®** include positive mechanical splicing, choices for Type 1 Type 2 applications, splices for black or galvanized or epoxy coated bars, easy visual inspection, no specialized equipment, minimal clearance requirements and positive center-stop. ZAP SCREWLOK® is ideal in remote areas and tight access areas; it is suitable for new construction repair or retrofit and compatible with sheared, flame-cut or saw-cut bars.

**Headed Anchorage** suitable for Grade 60 reinforcing can be created by welding Zap Structural Connectors and structural steel plates\*. For simplicity, **locally-sourced plate** that has been cut square has a cross sectional area equal to 10-times the nominal area of reinforcing bar will be more than adequate for many applications; but other sizes and shapes of plate can be attached to suit structural demands.

**ACI 318** Section 12.6 allows any mechanical device to be used as anchorage that is capable of developing at least the strength of the bar  $\{f_y\}$  without damage to concrete.



Example of Zap Screwlok® Termination (plate and welding by others)

Reinforcing bar sizes No.4 through No.18 (Ø12 through 57 mm) that meet the deformation requirements of ASTM A 615/A 615M or ASTM A 706/A 706M can be anchored by this method. Applications might include the substitution of hook bars in congested area, or in renovation and repair work, to enhance straight bars where development length is inadequate. Headed bars reduce the development length of bars by transmitting a proportion of force from bar to concrete via head bearing area.

Square Headed Mechanical Anchorage Dimensions

Rebar and Zap 'SL' Structural Connector Size	4	5	6	7	8	9	10	11	14	18
Square plate side length (in.)	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5	6 1/2
Plate thickness (in.)	1/2	1/2	5/8	5/8	3/4	3/4	7/8	1	1 1/4	1 3/4

\*Welder qualification, weld procedure, integrity and strength are the responsibility of others.

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BarSplice Products, Inc., 4900 Webster Street, Dayton OH 45414, USA  
 ●Tel: (937) 275-8700 ●Fax: (937) 275-9566 ●E-mail: bar@barsplice.com



# ZAP STRUCTURAL CONNECTORS

## SHEAR SCREW AND WEDGE WELDABLE CONNECTOR



- **STRENGTH RATING** – Has capacity to exceed a minimum joint strength of 75,000 psi measured in the rebar; equal to 125% x specified yield, Grade 60.
- **COMPATIBILITY** – For use with black ASTM A 615 Grade 60 or ASTM A 706. Has capacity to exceed 1.25 x specified yield in all cases.
- **VERSATILITY** – For attachment of reinforcing bars to plates, structural steel shapes or for creating headed anchorage. Shop or field weldable, before or after bar placement.
- **CERTIFIED LOW CARBON STEEL** – Meets low carbon chemistry AISI Grade 1018 and/or 1026. Mill certified analysis for each heat lot of steel available.
- **WELDING BEVELS** – For full penetration, provided for greater strength, convenience and quality assurance.
- **LESS WELD STRESS** – Compared direct butt welds because outside diameter of structural connector is larger than the reinforcing bar so the weld area is disposed over greater length.

# DOUBLE BARREL ZAP SCREWLOK

## SHEAR SCREW AND DOUBLE WEDGE MECHANICAL LAP SPLICE



- **MECHANICAL LAP SPLICE** – ACI 318 Chapter 12 – Confirming in-air tests exceed 125% x specified yield,  $f_y$ , with capacity to develop over 150% x  $f_y$ , ASTM A 615 black deformed Grade 60 bar.
- **APPLICATIONS** – In accordance with Building Code Requirements for Structural Concrete, used to widen bridges, slab repair, to connect hoop bars and in piles to terminate spirals.
- **SUPERIOR TO ALL TENSION LAP SPLICES** – Eliminates hard-to-predict nature of lap splices – especially long epoxy bar laps – Positive connection instead of reliance on concrete.
- **COMPACT DESIGN** – Shorter than mechanical butt-splices and significantly shorter than lap splices – less room needed – ideal for many repair applications and construction joints.
- **DOT PROJECTS and COATED BARS** – Exceeds 135% x specified yield, Grade 60 when installed directly over black ASTM A 615 bars, epoxy coated ASTM A 775 bars or galvanized ASTM A 767 bars.
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bars #3 – 7 (Dia.10 – 22 mm).

# DOUBLE BARREL ZAP TRANSITION

## SHEAR SCREW AND DOUBLE WEDGE MECHANICAL LAP SPLICE



- **PURPOSE** – For mechanical lap splicing bars of different sizes, such as 6-to-5, 5-to-4 and so on – or for connecting bars of different types such as old to new.
- **APPLICATIONS** – Bridges widening, slab repair, hoop bars, closure pours – use in accordance with Building Code Requirements for Structural Concrete.
- **SIMPLE DESIGN** – One piece device with converging sides for wedging of different bar sizes – manufactured as ductile casting with no welds.
- **FOR STANDARD REINFORCING BARS** – ASTM A 615, ASTM A 706, ASTM A 996, ASTM A 775 or ASTM A 767 bars and equivalent deformed bars.
- **PERFORMANCE** – Capacity to exceed 125% x specified yield,  $f_y$ , 135% x  $f_y$  and 150% x  $f_y$ , ASTM A 615 Grade 60 black deformed bars. Also exceeds 135% x  $f_y$ , ASTM A 775 / A 767 Grade 60 bar.
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection.

## \*\* HOW TO SPECIFY ZAP SCREWLOK® SPLICES and CONNECTORS

	By Name:	By Generic Description:
BAR-TO-BAR mechanical butt splice	Zap Screwlok® Type 2 Series <u>or</u> Epoxy Series <u>or</u> 'SL' Series by BarSplice Products, Inc., Dayton OH	Mechanical butt splices shall be the tension-compression shear screw and wedge coupling sleeve type, with smooth converging sides and cone-pointed hex-head screws, to develop a strength in the bar equal to [state strength requirement].
BAR-TO-BAR mechanical lap splice	Double Barrel Zap Screwlok® by BarSplice Products, Inc., Dayton OH	Mechanical lap splices shall be the shear screw and double wedge coupling sleeve type, with converging sides and cone-pointed hex-head screws opposite the wedges.
BAR-TO-STRUCTURAL STEEL	Zap Screwlok® Structural Connectors by BarSplice Products, Inc., Dayton OH	Bar-to-structural steel connections shall be the shear screw and wedge weldable connector type with smooth converging sides, cone-pointed hex-head screws and weld bevels inclined 30-degrees to the rebar axis.

\*\* Include flange requirements, if any, bar size(s), bar type and grade. Include statement: "Parts shall be manufactured to the quality requirements of ISO 9001."

Field splicing of reinforcing bars by the Zap Screwlok method is most popular because of the systems simplicity, cost effectiveness and adaptability. Instructions provided with splices explain step-by-step installation and safety information. All Zap Screwlok® Systems and Methods are protected by patents.

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## ZAP SCREWLOK TYPE 2 SERIES

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- **TYPE 2 SPLICE** – ACI 318 Chapter 21 and International Building Code, ICC ES Evaluation Report ER-5461. Exceeds specified tensile strength ASTM A 706 / A 615 Grade 60 black deformed bars.
- **SEISMIC LOADING** – Withstands plastic strain excursions to 5 x rebar yield strain value and stress reversals in accordance with ICC Acceptance Criteria AC-133.
- **NEW CONSTRUCTION or RENOVATION / REPAIR** – Suited for butt-splicing bars new-to-new or new-to-old. Tested with Grades 30, 33, 40 and 50, square and round, to 1.25  $f_y$ .
- **GRADE 75 BARS\*** – Exceeds 125% x specified yield black ASTM A 615 Grade 75 and capable of developing 100,000 psi, the specified tensile strength of Grade 75.
- **CALTRANS "SERVICE" APPROVED** – Meets slip test 670 & capable of exceeding 80,000 psi, the specified tensile strength of black deformed bars ASTM A 706. Not classified as Caltrans "Ultimate".
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bars #3 – 14 (Dia.10 – 43 mm).
- **DOT PROJECTS** – Capacity to exceed 125% x specified yield, 135% x specified yield and 150% x specified yield, ASTM A 615 Grade 60 black deformed bars.

\* Zap Screwlok Type 2 series is not suitable for use with ASTM A 1035 Grade 100/120 MMF-X bars or "Dual-Certified" Grade 75/100, Grade 80/100 bars or any variation thereof. Contact BPI for Zap Screwlok 'FX' series.



## ZAP SCREWLOK EPOXY SERIES

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- **AASHTO and DOT PROJECTS** – Exceeds 125% x specified yield ( $f_y$ ) per AASHTO *Standard Specifications for Highway Bridges* (17<sup>th</sup> Ed). Also exceeds 135% x  $f_y$  Grade 60 bar (81,000 psi).
- **PURPOSE** – For butt-splicing epoxy coated bars that comply with AASHTO specifications and the coating requirements of ASTM A 775 Grade 60.
- **APPLICATIONS** – Widely used on bridge decks, and parking garages susceptible to salt induced damage. Other adverse conditions include wastewater treatment and chemical plants.
- **CYCLIC LOADING** – Qualified to DOT protocols including 100 cycles 5%  $f_y$  to 90%  $f_y$  in tension and 10,000 cycles stress reversal from 25,000 psi tension to 25,000 psi in compression.
- **HIGH FATIGUE STRENGTH** – Pre-qualified to '18 ksi' stress-range by testing for more than 1-million cycles of load.
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection.



## ZAP SCREWLOK 'SL' SERIES

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- **ACI 318 Chapter 12 FULL MECHANICAL SPLICE** – Develops in tension or compression, as required, at least 1.25  $f_y$  of the bar, ASTM A 615 black deformed Grade 60.
- **COMMERCIAL APPLICATIONS** – In accordance with Building Code Requirements for Structural Concrete, product is used in columns, beams, walls, mats, tanks, condominiums.
- **SUPERIOR TO ALL TENSION LAP SPLICES** – Strength is independent of surrounding concrete and cover. Takes up less space than rebar lap. Replaces lap splice classes A, B or C.
- **COMPACT DESIGN** – Shorter than Type 2 series – fewer screws – less room needed – faster installation time – ideal for hard-to-reach places.
- **FOR STANDARD REINFORCING BARS** – ASTM A 615, ASTM A 996 and equal black deformed bars – capable of exceeding 125% x specified yield,  $f_y$ , and 130% x  $f_y$ , Grades 40, 50 and 60.
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection. For bars #3 – 18 (Dia.10 – 57 mm).



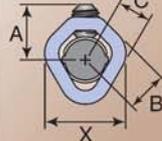
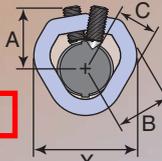
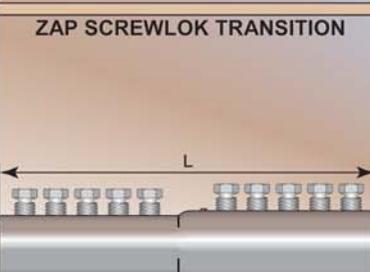
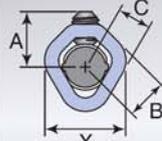
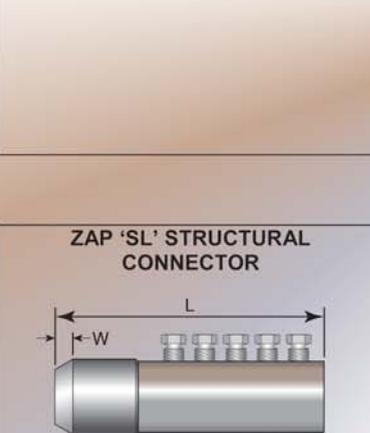
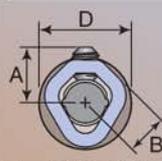
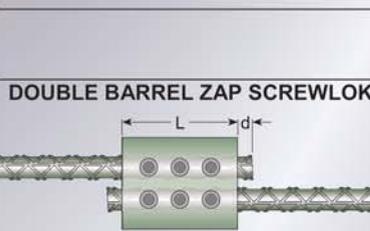
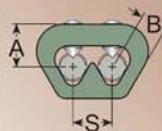
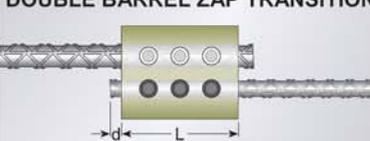
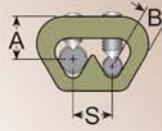
## ZAP SCREWLOK TRANSITIONS

### SHEAR SCREW AND WEDGE MECHANICAL SPLICE COUPLING SLEEVE

- **PURPOSE** – For butt-splicing bars of different sizes, such as 11-to-10, 11-to-9 and so on – or for connecting bars of different configurations such as 1"-square-to-#9.
- **APPLICATIONS** – Columns, Walls, Piers, Caissons, Parking Garages, High Rise Buildings – usually vertical bars.
- **SIMPLE DESIGN** – One piece device with converging sides for wedging of different bar sizes – Made from seamless shaped tubing with no welds – Includes center stop.
- **TYPE 2 SPLICE** – ACI 318 Chapter 21 Seismic Design and International Building Code. Develops specified tensile strength of black *smaller* bars ASTM A 706 or A 615.
- **SEISMIC LOADING** – Withstands plastic strain excursions to 5 x rebar yield strain value and stress reversals in accordance with ICC Acceptance Criteria AC-133.
- **CONVENIENCE** – Field installed – No specialized installation equipment – No special bar end preparation or thread cutting – Easy visual inspection.
- **DOT PROJECTS** – Capacity to exceed 125% x specified yield,  $f_y$ , 135% x  $f_y$  and 150% x  $f_y$ , ASTM A 615 Grade 60 black deformed smaller bar. Also exceeds 135% x  $f_y$ , ASTM A 775 epoxy Grade 60 bar.



# ZAP SCREWLOK®— Dimensions and Data [inch-pound units]

	Coupler Size	Coupler Weight (lb)	Length 'L' (in)	'A' (in)	'B' (in)	'C' (in)	'X' (in)	Number Screws per Bar	Average Torque (ft-lbs)	END VIEW (after Assembly)
<b>ZAP SCREWLOK TYPE 2 / EPOXY SERIES</b> 	3	1.0	5	1 <sup>3</sup> / <sub>16</sub>	5/8	7/16	1 1/8	2	50	<b>sizes #3 - #11</b> 
	4	2.2	7	1 1/16	1 <sup>1</sup> / <sub>16</sub>	1/2	1 3/8	3	50	
	5	3.4	9	1 1/8	3/4	5/8	1 1/2	4	50	
	6	4.7	11	1 3/16	15/16	11/16	1 3/4	5	50	
	7	7.6	13	1 1/4	1 1/16	13/16	2 1/16	5	100	
	8	10.9	15 1/4	1 5/16	1 1/16	7/8	2 1/4	6	100	
	9	17.6	16 3/4	1 5/8	1 1/4	1 1/16	2 5/8	6	200	
	10	21.4	19 1/8	1 11/16	1 7/16	1 1/8	2 3/4	7	200	
11	25.4	21 1/2	1 13/16	1 1/2	1 1/4	2 15/16	8	200		
14	31.7	15 3/8	2 5/8	1 3/4	1 1/2	3 3/4	9	350		
<b>ZAP 'SL' SERIES</b> 	4	1.5	5	1 1/16	11/16	1/2	1 3/8	2	50	<b>sizes #14, #18</b> 
	5	2.6	7	1 1/8	3/4	5/8	1 5/8	3	50	
	6	3.8	9	1 3/16	15/16	11/16	1 3/4	4	50	
	7	6.2	10 3/4	1 1/4	1 1/16	13/16	2 1/16	4	100	
	8	9.3	13	1 5/16	1 1/16	7/8	2 1/4	5	100	
	9	14.3	13 7/8	1 5/8	1 1/4	1 1/16	2 5/8	4	200	
	10	18.2	16 1/2	1 11/16	1 7/16	1 1/8	2 3/4	5	200	
	11	22.3	19 3/8	1 13/16	1 1/2	1 1/4	2 15/16	6	200	
	14	26.0	13	2 5/16	1 3/4	1 1/2	3 3/4	7	350	
	18	58.4	23 1/2	2 1/2	2 1/4	1 13/16	4 3/8	16	350	
<b>ZAP SCREWLOK TRANSITION</b> 	5/4	3.0	8	1 1/8	3/4	5/8	1 5/8	3	50	
	6/4	4.3	10	1 3/16	15/16	11/16	1 3/4	4	50	
	6/5	4.3	10	1 3/16	15/16	11/16	1 3/4	4	50	
	7/5	6.8	12	1 1/4	1 1/16	13/16	2 1/16	4	100	
	7/6	6.8	12	1 1/4	1 1/16	13/16	2 1/16	4	100	
	8/6	9.9	14 1/8	1 5/16	1 1/8	7/8	2 1/4	5	100	
	8/7	9.9	14 1/8	1 5/16	1 1/8	7/8	2 1/4	5	100	
	9/7	16.2	15 9/16	1 5/8	1 1/4	1 1/16	2 5/8	5	200	
	9/8	16.2	15 9/16	1 5/8	1 1/4	1 1/16	2 5/8	5	200	
	10/7	20.1	17 15/16	1 11/16	1 7/16	1 1/8	2 3/4	6	200	
	10/8	20.1	17 15/16	1 11/16	1 7/16	1 1/8	2 3/4	6	200	
	10/9	20.1	17 15/16	1 11/16	1 7/16	1 1/8	2 3/4	6	200	
	11/7	20.1	17 15/16	1 13/16	1 1/2	1 1/4	2 13/16	6	200	
	11/8	20.1	17 15/16	1 13/16	1 1/2	1 1/4	2 13/16	6	200	
11/9	20.1	17 15/16	1 13/16	1 1/2	1 1/4	2 13/16	6	200		
11/10	22.8	20 9/16	1 13/16	1 1/2	1 1/4	2 13/16	7	200		
14/10	29.5	21 1/2	2 1/8	1 3/4	1 3/8	3 3/8	8	200		
14/11	29.5	21 1/2	2 1/8	1 3/4	1 3/8	3 3/8	8	200		
<b>ZAP 'SL' STRUCTURAL CONNECTOR</b> 	Connector Size	Connector Weight (lb)	Length 'L' (in)	'A' (in)	'B' (in)	'D' (in)	'W' (in)	Number Screws per Bar	Average Torque (ft-lbs)	END VIEW (after Assembly)
	4	0.9	2 7/8	1 1/16	11/16	1 7/16	3/16	2	50	<b>sizes #4 - #11</b> 
	5	1.5	4 1/8	1 1/8	3/4	1 11/16	1/4	3	50	
	6	2.3	5 3/8	1 3/16	15/16	1 7/8	1/4	4	50	
	7	3.6	6 3/8	1 1/4	1 1/16	2 1/8	3/16	4	100	
	8	5.5	7 7/8	1 5/16	1 1/16	2 5/16	3/8	5	100	
	9	7.6	7 1/2	1 5/8	1 1/4	2 11/16	7/16	4	200	
	10	9.6	8 7/8	1 11/16	1 7/16	2 7/8	1/2	5	200	
	11	12.1	10 1/2	1 13/16	1 1/2	3	9/16	6	200	
14	18.0	8 7/8	2 5/16	1 3/4	3 13/16	11/16	7	350		
18	37.5	15 3/8	2 1/2	2 1/4	4 1/2	7/8	16	350		
<b>DOUBLE BARREL ZAP SCREWLOK</b> 	Coupler Size	Coupler Weight (lb)	Length 'L' (in)	'A' (in)	'B' (in)	'S' (in)	'd' (in)	Number Screws per Bar	Average Torque (ft-lbs)	END VIEW (after Assembly)
	3	1.3	2 1/8	1 1/8	3/8	15/16	3/8	2	50	
	4	1.3	2 1/8	1 1/16	1/2	15/16	1/2	2	50	
	5	2.3	3	1 1/8	5/8	15/16	5/8	3	50	
	6	3.2	3 7/8	1 3/16	3/4	15/16	3/4	4	50	
7	7.1	5 3/8	1 5/16	7/8	1 3/8	7/8	4	100		
<b>DOUBLE BARREL ZAP TRANSITION</b> 	4/3	1.3	2 1/8	1 1/16	3/8	15/16	3/8	2	50	
	5/4	2.3	3	1 1/8	1/2	15/16	1/2	3	50	
	6/5	3.2	3 7/8	1 3/16	5/8	15/16	5/8	4	50	
	7/6	7.1	5 3/8	1 5/16	3/4	1 3/8	3/4	4	100	