



## **Recommended Fixings Manual for**



# TOTAL70

## **Suite of Profiles**

### **SPECIAL NOTES WITH REFERENCE TO DOOR HINGE FASTENERS**

Due to the extensive range and specification of door hinge hardware, the recommendations within this manual are intended as a guide only. It is therefore essential that you contact Rapiertstar Technical Department for advice on correct fastener selection for your individual requirements.

## The Correct Fastener

**rapierstar**® the market-leading supplier of screws to the PVC-U window industry, with its unrivalled technical expertise, has worked together with your systems company to produce this recommended fixings manual. The following pages contain advice on the correct fastener for each application.



Your orders are despatched direct from our purpose-built premises near Congleton in Cheshire.


## Star Performance

**rapierstar**® StarPVCU window screws have conformed with all relevant industry standards, guidelines and recommendations for some time and are intended to be used where mechanical resistance, stability and safety of use in the sense of the 'essential requirements' of Annex I of the Construction Products Regulation 305/2011 are to be fulfilled.

## Surpassing Standards

**rapierstar**® branded product ranges have been certified by European approved 'Notified Bodies', confirming initial type testing and assessment & verification of constancy of performance.

**BS EN 14351-1:2006+A1:2010**, Windows and doors product standard, performance characteristics.

 **rapierstar**® branded screws conform with the requirements of harmonised European standard BS EN 14351-1 and have been type tested to meet the standard of BS EN 14566:2008+A1:2009. By conforming with this standard, we are describing, with independent verification, that the head/thread/point maintain consistency of design. This also guarantees that the production of steel screws is to EU standards and that factory controls are in place during manufacture.

**PAS 24:2012** Windows and doors fabricated with correct StarPVCU screws exceed PAS 24:2012 - enhanced security performance requirements for doorsets and windows in the UK. PAS 24:2012 supersedes PAS 24:2007 and BS 7950:1997, which are withdrawn.

**BS EN 1670:2007** Electroplating coatings of **rapierstar**® products comply with the provisions of ISO 2081:2008 and exceed corrosion resistance testing to BS EN 1670 grade 4 for Carbon Steel screws and BS EN 1670 grade 5 for Stainless Steel screws.

**ISO 9000**, is a family of standards relating to quality management and are designed to help organisations ensure they meet the needs of customers. **rapierstar**® is an ISO 9001:2008 registered company and all our window screws are manufactured by ISO 9000 certificated companies. Full traceability is maintained so long as the screws remain in the box in which they were supplied.

## Screw Tips - Best Practice

**Perpendicular Insertion:** Ensure that any fastener is applied at 90° to the material at all times.

**Mechanical Damage:** It is important to replace the screwdriver bit regularly. A worn screwdriver bit may not engage fully into the recess, causing damage to the plating of the screw with the resulting likelihood of corrosion.

**Torque Setting:** The use of excessive torque may lead to stripping and failure of the fastener. The torque setting on the screwdriver should be the minimum required to effect a complete fastening.

**Screwdriver Speed:** It is recommended by the Glass & Glazing Federation and the British Plastics Federation that driver speeds between 1500 rpm and 2000 rpm are used.

## Avoid Corrosive Elements

Several factors can cause screws to rust, each of which can be accelerated depending on the situation of the application.

**Silicone sealants** - avoid acetic acid cured high and low modulus sealants. The vapour alone is sufficient to cause corrosion. Therefore a neutral curing sealant is recommended.

**Acrylic fillers** - contact with any carbon steel component will cause corrosion.

**Cleaners** - aggressive cleaning substances, especially those containing ammonia, chlorine etc. can reduce the effectiveness of the protective plating and should be avoided.

**New-build** - screws should not come into contact with wet plaster or cement, as the lime content will cause corrosion. Also, the acid wash that is often used to clean brickwork is highly corrosive and should be avoided completely. **Where any of the above conditions are likely to exist, the use of stainless steel is recommended.**

## 100% Stainless

### 100% Solution

For coastal or heavily polluted regions of the country, when attaching stainless steel hardware, or where prolonged guarantees are being offered, we recommend that stainless steel screws should be used.

### Identification of Stainless Window screws

Unique head design eliminates confusion between the grades of stainless steel used. Clear product marking on the head of **rapierstar**® window screws allows immediate identification of the grade of stainless steel from which the screws are manufactured. This ensures that specifications are adhered to.



### Austenitic Stainless Steel - 302

Because 302 grade Austenitic stainless steel is intrinsically soft, it is unsuitable for self-drilling applications. However, it is ideal for use in PVC-U only applications, giving excellent corrosion resistance.



### Enhanced Martensitic Stainless Steel - 410

410 grade Martensitic stainless steel is a harder grade which is capable of self-drilling and tapping into steel reinforcement. Screws are independently tested by UKAS accredited test bodies to beyond 3000 hours salt spray test in accordance with BS EN ISO 9227.



### Bi-Metallic

Austenitic stainless steel fastener with a carbon steel drill tip. Suitable for reinforced applications. Combination recess with square drive giving effective 'stick-fit' onto the driver bit for ease of insertion during fabrication and common Phillips no2 recess for on-site adjustment. Often accepted by Councils and Housing Associations for use in the manufacture of windows and doors.

**In any application where fasteners are required to be guaranteed free from hydrogen embrittlement or any other form of hydrogen induced cracking (HIC), Rapierstar always recommend that fasteners manufactured from a grade of stainless steel considered suitable for the end application be specified and used.**

## Rapier® StarFix

In choosing **rapierstar**, you have used the industry's leading supplier of window screws to manufacture your windows and doors. To maintain your high standards, have your products installed using the best quality fixings. **StarFix is the most widely used plugless frame fixing available today. Recommend StarFix to your installer.**



### Masonry Fixing

- ▶ No Plug Required
- ▶ High Strength Fixing
- ▶ 50% Quicker Assembly
- ▶ 30% Less Drive-in Torque Required

### High Tech Fixing

The award winning **StarFix** is probably the most efficient direct masonry fixing available. The patented StarForm thread provides 30% lower drive-in torque and up to 50% quicker assembly. A cost effective and time saving installation with exceptional holding power.



LENGTH (mm)								
62	82	102	112	122	152	152	182	202





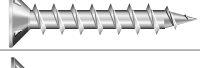
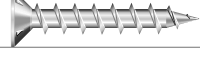












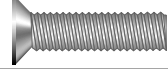
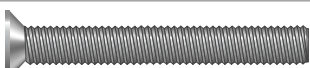
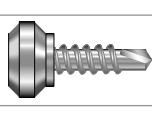
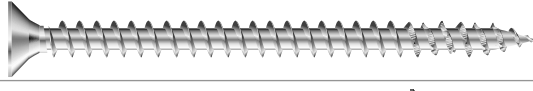

Yellow finish. 7.5mm Diameter.  
6.0mm / 6.5mm pilot hole required  
8.0mm clearance hole

In tests, **StarFix** has consistently outperformed other lower cost plugless fixings that are often claimed to be it's equal.












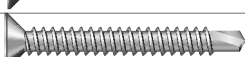









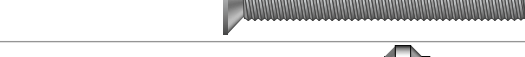

Faster, low torque insertion means battery life of power tools is extended during installation, a valuable cost and time-saving element.

**StarFix** provides high shear strength and in tests, pull-out values into London Brick, Concrete Block and Engineering Brick have proved exceptional. For details of these test results visit [www.rapierstar.com](http://www.rapierstar.com)

## Carbon Steel

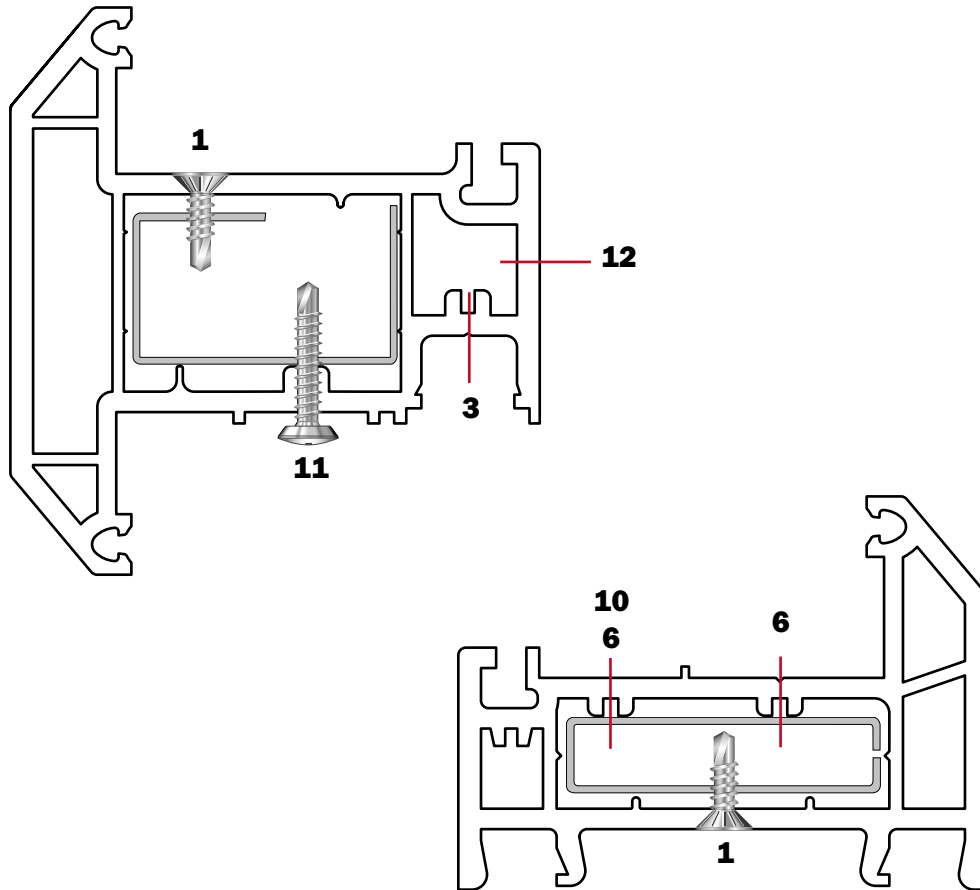
	Code	Item	Application
	RSR 3.9 x 13 Z	<b>1</b>	Reinforcement retention
	CFG 4.3 x 22 Z	<b>2</b>	Gearing to Tilt/Turn sash
	CFG 4.3 x 25 Z	<b>3</b>	Gearing
	CFG 4.3 x 25 Z	<b>3</b>	Keep
	CFG 4.3 x 25 Z	<b>3</b>	Run-up block
	CFG 4.3 x 25 Z	<b>3</b>	Pull-in block
	CFG 4.3 x 35 Z	<b>4</b>	Corner hinge to Tilt/Turn sash
	CFG 4.3 x 65 Z	<b>5</b>	Butt hinge to sash
	CSR 3.9 x 25 Z	<b>6</b>	Keep
	CSR 3.9 x 25 Z	<b>6</b>	Pull-in block
	CSR 3.9 x 32 Z	<b>7</b>	Hinge to Tilt/Turn frame
	CSR 3.9 x 32 Z	<b>7</b>	Butt hinge to door frame
	CSR 3.9 x 32 Z	<b>7</b>	Gearing to door sash
	CSR 4.8 x 38 Z	<b>8</b>	Flag hinge to sash and frame
	SFG 4.3 x 16 Z	<b>9</b>	Friction stay to PVCU
	SSR 3.9 x 16 Z	<b>10</b>	Friction stay to reinforcement
	SSR 3.9 x 19 Z	<b>11</b>	Friction stay to sash
	SSR 3.9 x 19 Z	<b>11</b>	Restrictor
	MS M5 x 20 Z	<b>12</b>	Handle to casement window
	MS M5 x 40 Z	<b>13</b>	Handle to Tilt/Turn sash
	NSR 4.0 x 13 Z	<b>14</b>	Weatherbar
	CPF 5.0 x 70 Z	<b>15</b>	Dummy vent to frame
	CPF 4.0 x 16 Z	<b>16</b>	Flag hinge to sash







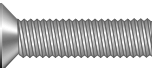
## Stainless Steel

	Code	Item	Application
	RSR 3.9 x 13 S	<b>1</b>	Reinforcement retention
	CFG 4.3 x 22 S	<b>2</b>	Gearing to Tilt/Turn sash
	CFG 4.3 x 25 S	<b>3</b>	Gearing
	CFG 4.3 x 25 S	<b>3</b>	Keep
	CFG 4.3 x 25 S	<b>3</b>	Run-up block
	CFG 4.3 x 25 S	<b>3</b>	Pull-in block
	CFG 4.3 x 35 S	<b>4</b>	Corner hinge to Tilt/Turn sash
	CFG 4.3 x 65 Z	<b>5</b>	Butt hinge to sash
	CSR 3.9 x 25 S	<b>6</b>	Keep
	CSR 3.9 x 25 S	<b>6</b>	Pull-in block
	CSR 3.9 x 32 S	<b>7</b>	Hinge to Tilt/Turn frame
	CSR 3.9 x 32 S	<b>7</b>	Butt hinge to door frame
	CSR 3.9 x 32 S	<b>7</b>	Gearing to door sash
	CSR 4.8 x 38 Z	<b>8</b>	Flag hinge to sash and frame
	SFG 4.3 x 16 S	<b>9</b>	Friction stay to PVCU
	SSR 3.9 x 16 S	<b>10</b>	Friction stay to reinforcement
	SSR 3.9 x 19 S	<b>11</b>	Friction stay to sash
	SSR 3.9 x 19 S	<b>11</b>	Restrictor
	MS M5 x 20 Z	<b>12</b>	Handle to casement window
	MS M5 x 40 Z	<b>13</b>	Handle to Tilt/Turn sash
	NSR 4.0 x 13 Z	<b>14</b>	Weatherbar
	CPF 5.0 x 70 Z	<b>15</b>	Dummy vent to frame
	CPF 4.0 x 16 Z	<b>16</b>	Flag hinge to sash

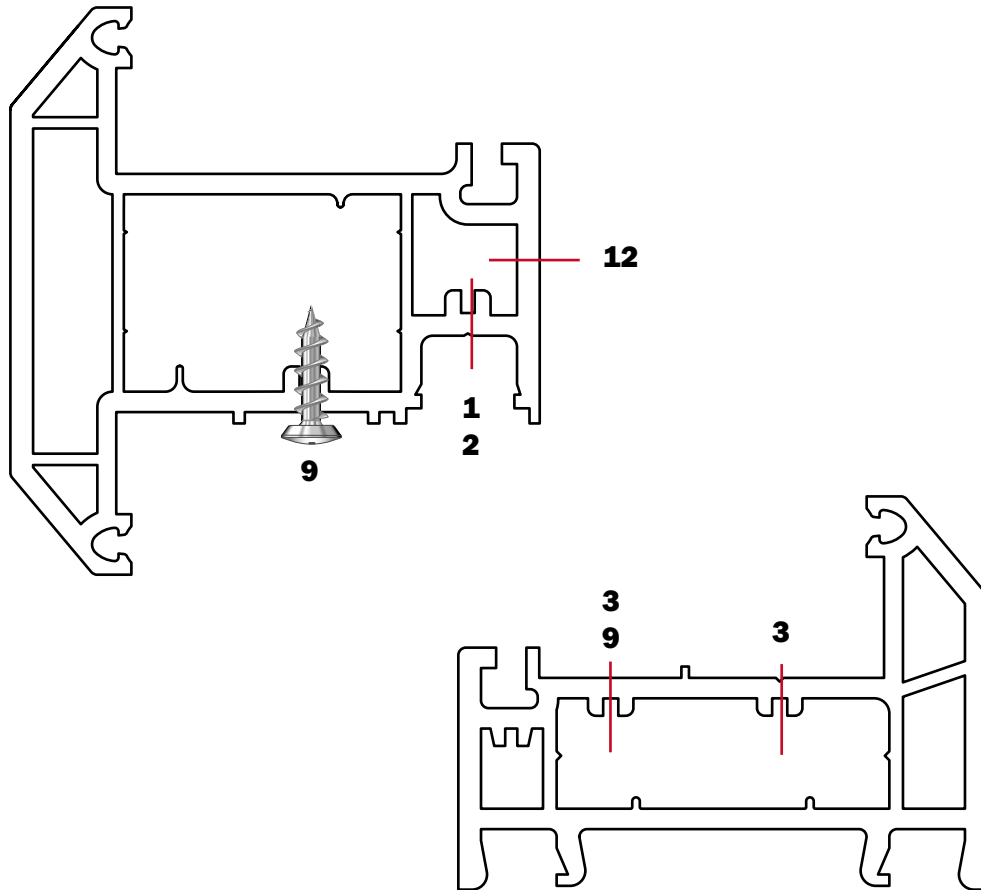





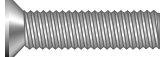
## Casement Window - Standard Outer Frame - 'T' Sash - Reinforced



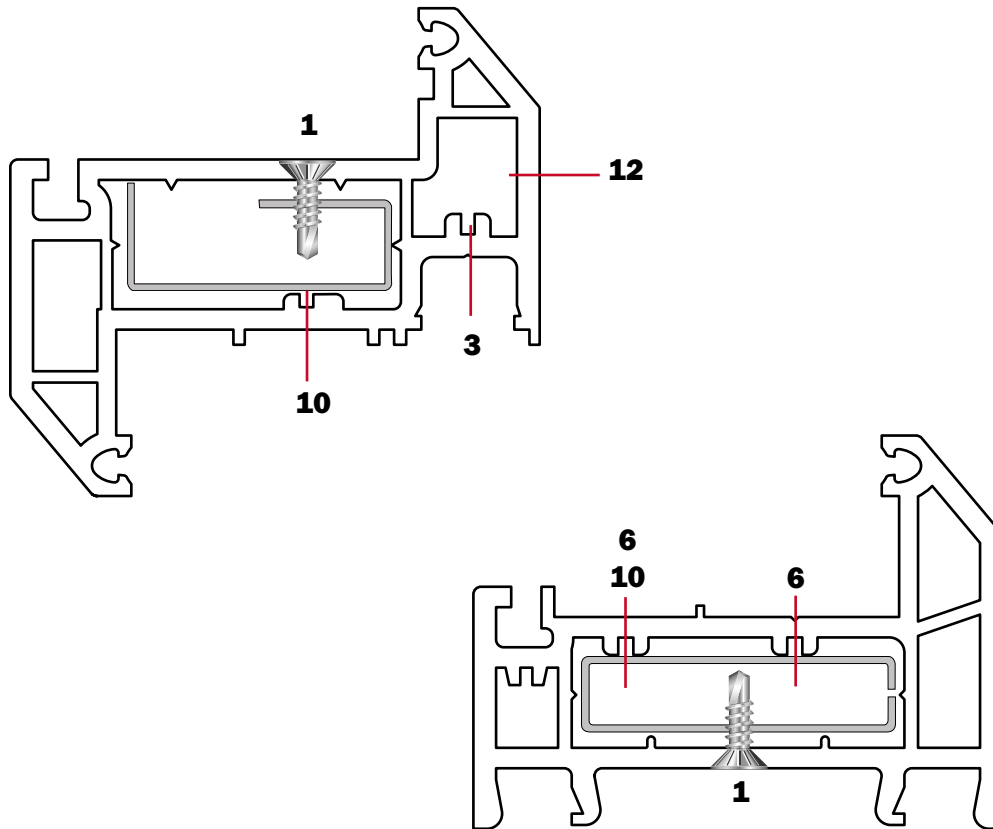
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|-----------|---|-----------------------|-----------------------------------|
| <b>1</b>  |  | <b>RSR 3.9 x 13 Z</b> | Reinforcement Retention           |
| <b>3</b>  |  | <b>CFG 4.3 x 25 Z</b> | Gearing, Pull-in Block            |
| <b>10</b> |  | <b>SSR 3.9 x 16 Z</b> | Friction Stay to Frame            |
| <b>11</b> |  | <b>SSR 3.9 x 19 Z</b> | Friction Stay to Sash, Restrictor |
| <b>6</b>  |  | <b>CSR 3.9 x 25 Z</b> | Keep                              |
| <b>6</b>  |  | <b>CSR 3.9 x 25 Z</b> | Pull-in Block                     |
| <b>12</b> |  | <b>MS M5 x 20 Z</b>   | Handle                            |

## Casement Window - Standard Outer Frame - 'T' Sash - Unreinforced



<b>3</b>		CFG 4.3 x 25 Z	Gearing, Keep
<b>3</b>		CFG 4.3 x 25 Z	Run-Up Block, Pull-in Block
<b>9</b>		SFG 4.3 x 16 Z	Friction Stay
<b>12</b>		MS M5 x 20 Z	Handle

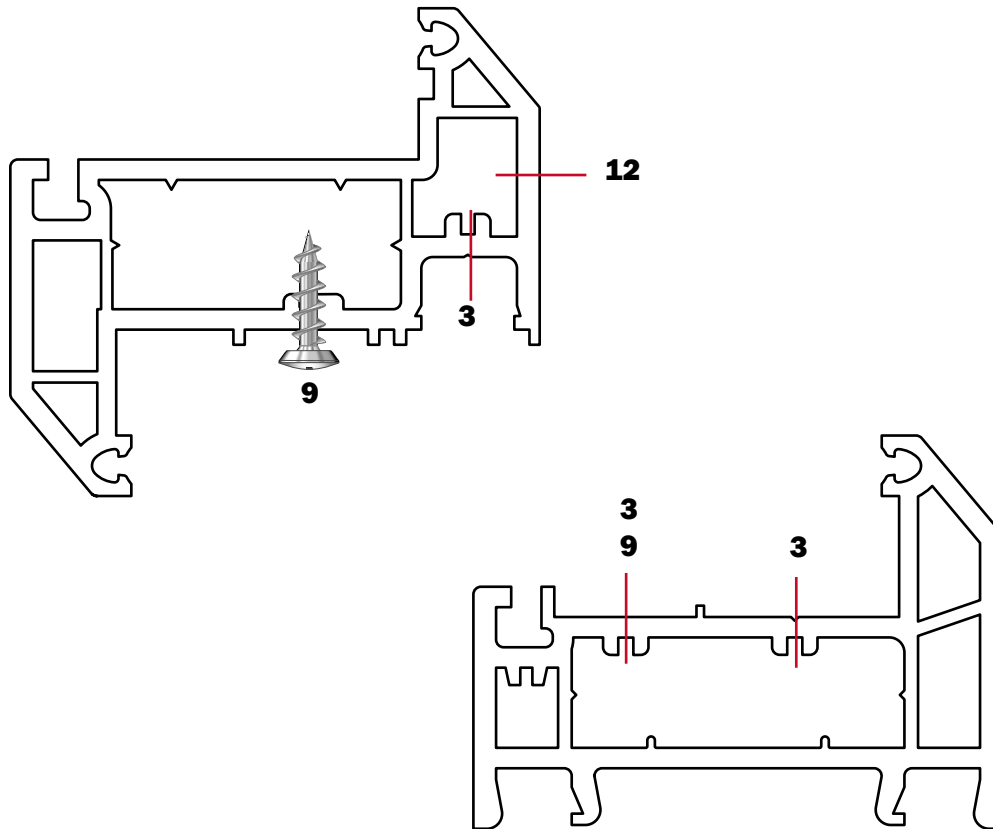
## Casement Window - Standard Outer Frame - 'Z' Sash - Reinforced







- |           |   |                |                         |
|-----------|---|----------------|-------------------------|
| <b>1</b>  |  | RSR 3.9 x 13 Z | Reinforcement Retention |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Gearing, Pull-in Block  |
| <b>6</b>  |  | CSR 3.9 x 25 Z | Keeps                   |
| <b>6</b>  |  | CSR 3.9 x 25 Z | Pull-in Block           |
| <b>10</b> |  | SSR 3.9 x 16 Z | Friction Stay           |
| <b>12</b> |  | MS M5 x 20 Z   | Handle                  |

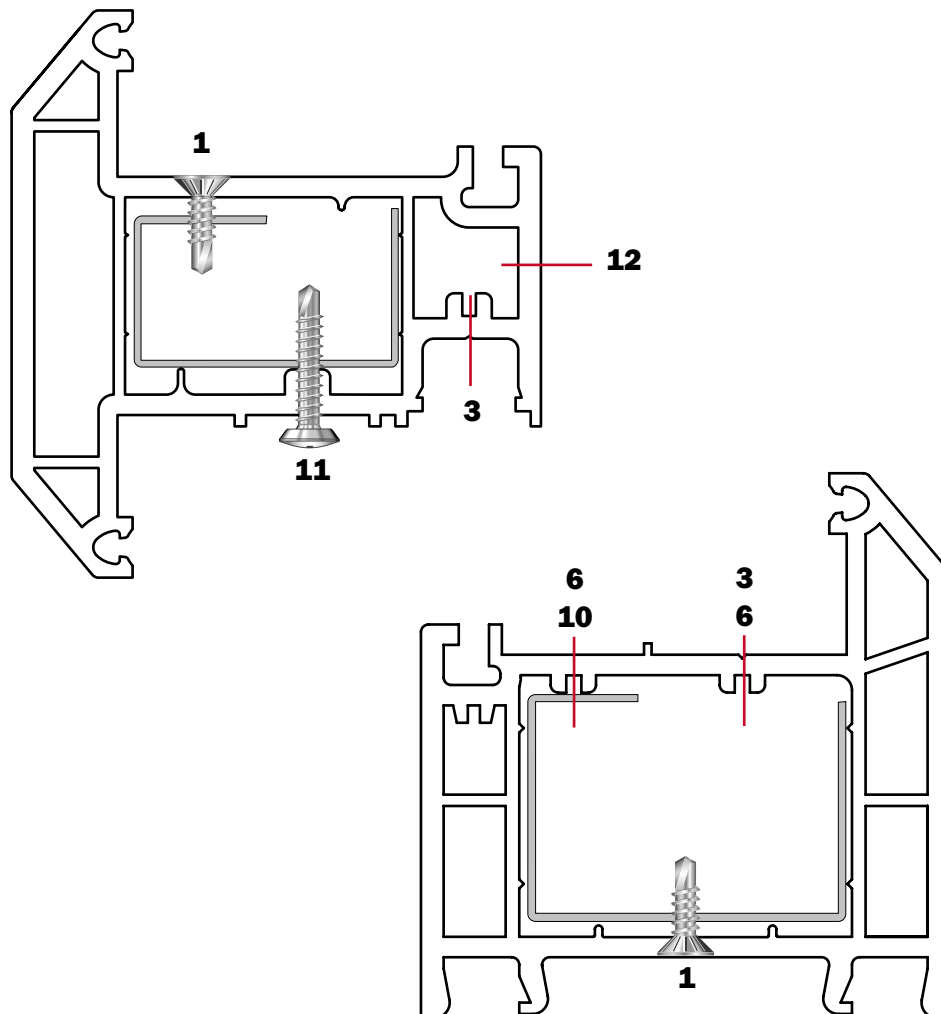









## Casement Window - Standard Outer Frame - 'Z' Sash - Reinforced



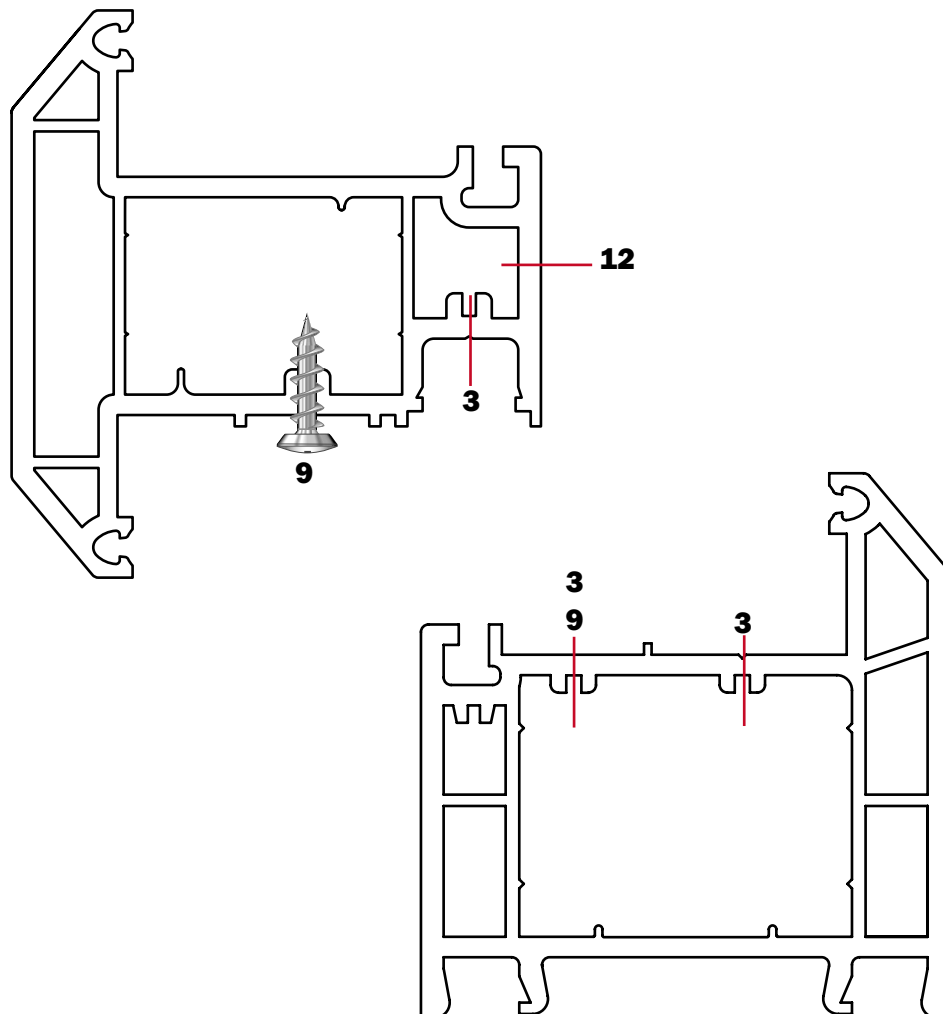
<b>3</b>		CFG 4.3 x 25 Z	Gearing, Keep
<b>3</b>		CFG 4.3 x 25 Z	Run-Up Block, Pull-in Block
<b>9</b>		SFG 4.3 x 16 Z	Friction Stay
<b>12</b>		MS M5 x 20 Z	Handle



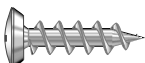
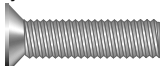
## Casement Window - Heavy Outer Frame - 'T' Sash - Reinforced



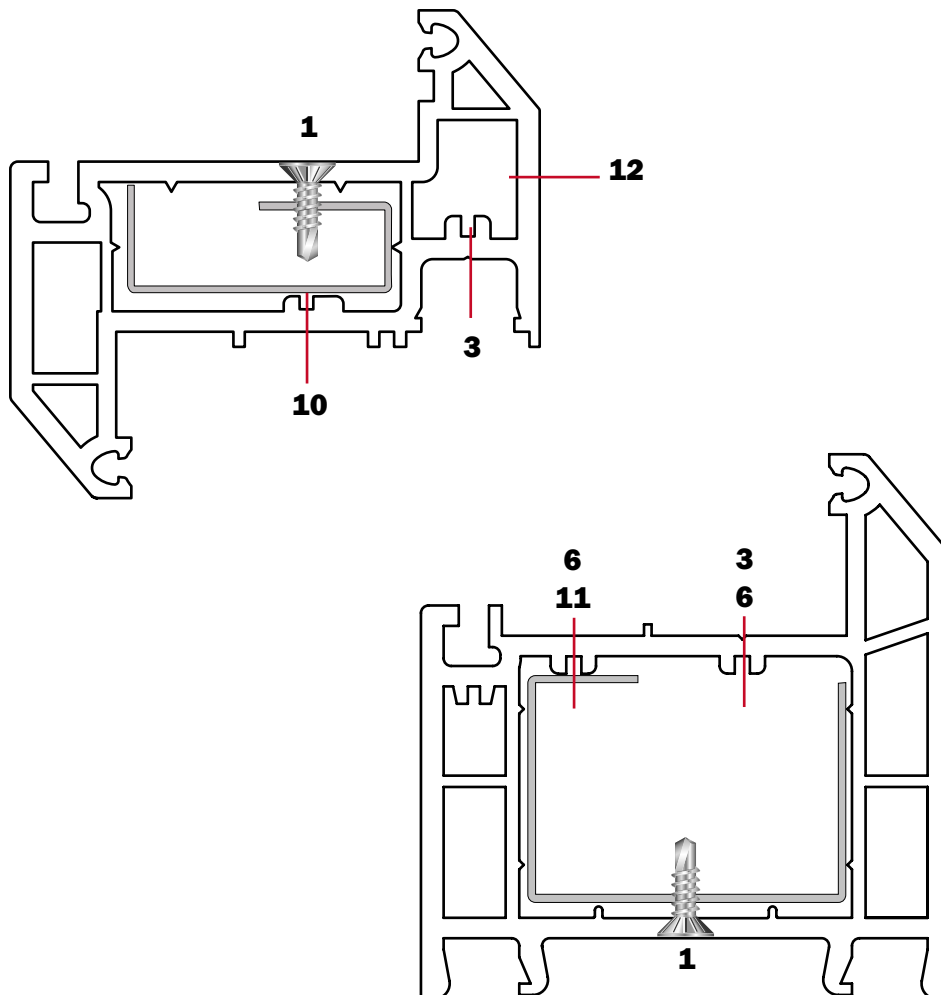
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|-----------|---|----------------|-----------------------------------|
| <b>1</b>  |  | RSR 3.9 x 13 Z | Reinforcement Retention           |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Gearing, Pull-in Block            |
| <b>10</b> |  | SSR 3.9 x 16 Z | Friction Stay to Frame            |
| <b>11</b> |  | SSR 3.9 x 19 Z | Friction Stay to Sash, Restrictor |
| <b>6</b>  |  | CSR 3.9 x 25 Z | Keep                              |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Pull-in Block                     |
| <b>12</b> |  | MS M5 x 20 Z   | Handle                            |








## Casement Window - Heavy Outer Frame - 'T' Sash - Unreinforced



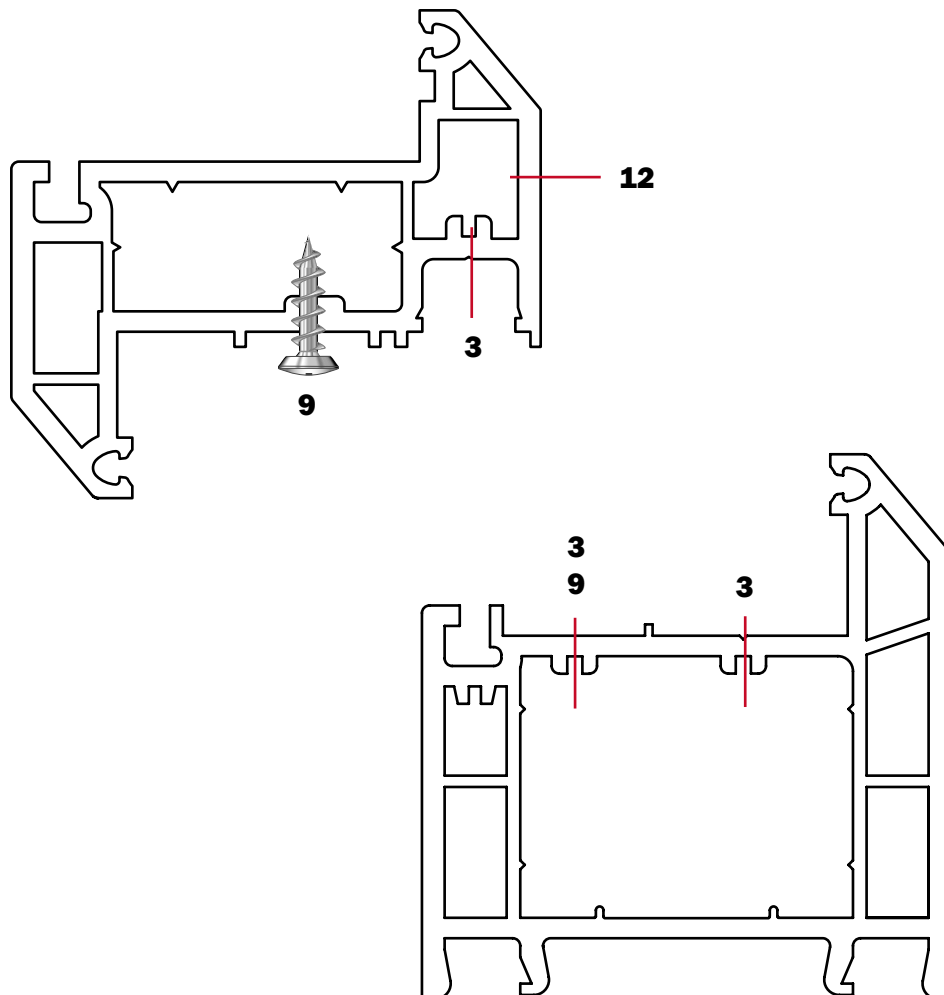
<b>3</b>		CFG 4.3 x 25 Z	Gearing, Keep
<b>3</b>		CFG 4.3 x 25 Z	Run-Up Block, Pull-in Block
<b>9</b>		SFG 4.3 x 16 Z	Friction Stay
<b>12</b>		MS M5 x 20 Z	Handle





## Casement Window - Heavy Outer Frame - 'Z' Sash - Reinforced



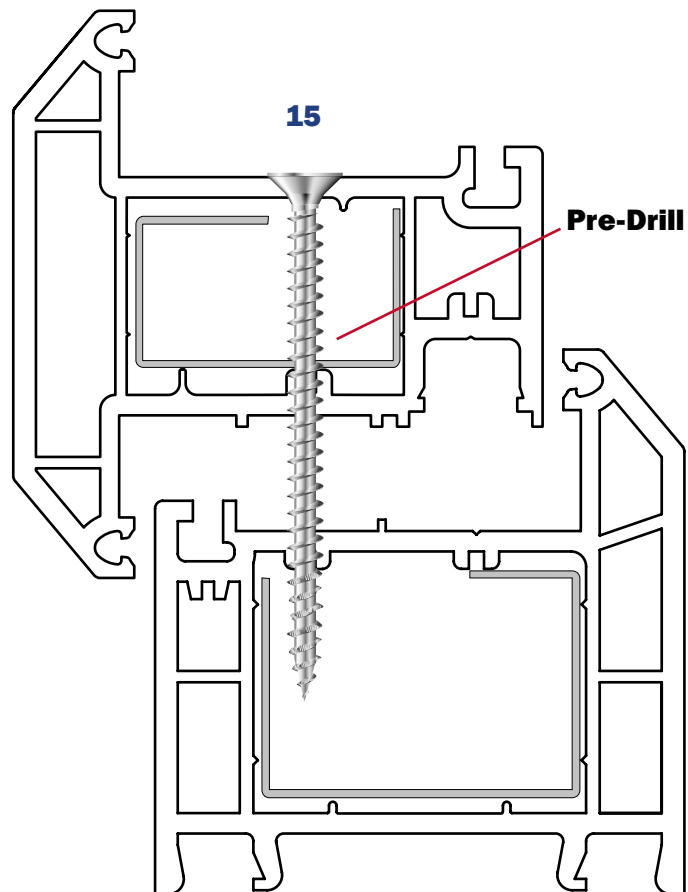
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|-----------|---|----------------|-----------------------------------|
| <b>1</b>  |  | RSR 3.9 x 13 Z | Reinforcement Retention           |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Gearing, Pull-in Block            |
| <b>10</b> |  | SSR 3.9 x 16 Z | Friction Stay to Frame            |
| <b>11</b> |  | SSR 3.9 x 19 Z | Friction Stay to Sash, Restrictor |
| <b>6</b>  |  | CSR 3.9 x 25 Z | Keep                              |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Pull-in Block                     |
| <b>12</b> |  | MS M5 x 20 Z   | Handle                            |

## Casement Window - Heavy Outer Frame - 'Z' Sash - Reinforced

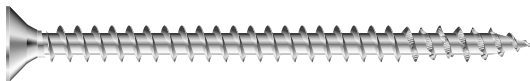


- |           |   |                |                             |
|-----------|---|----------------|-----------------------------|
| <b>3</b>  |  | CFG 4.3 x 25 Z | Gearing, Keep               |
| <b>3</b>  |  | CFG 4.3 x 25 Z | Run-Up Block, Pull-in Block |
| <b>9</b>  |  | SFG 4.3 x 16 Z | Friction Stay               |
| <b>12</b> |  | MS M5 x 20 Z   | Handle                      |

## Heavy Outer Frame with Dummy Vent



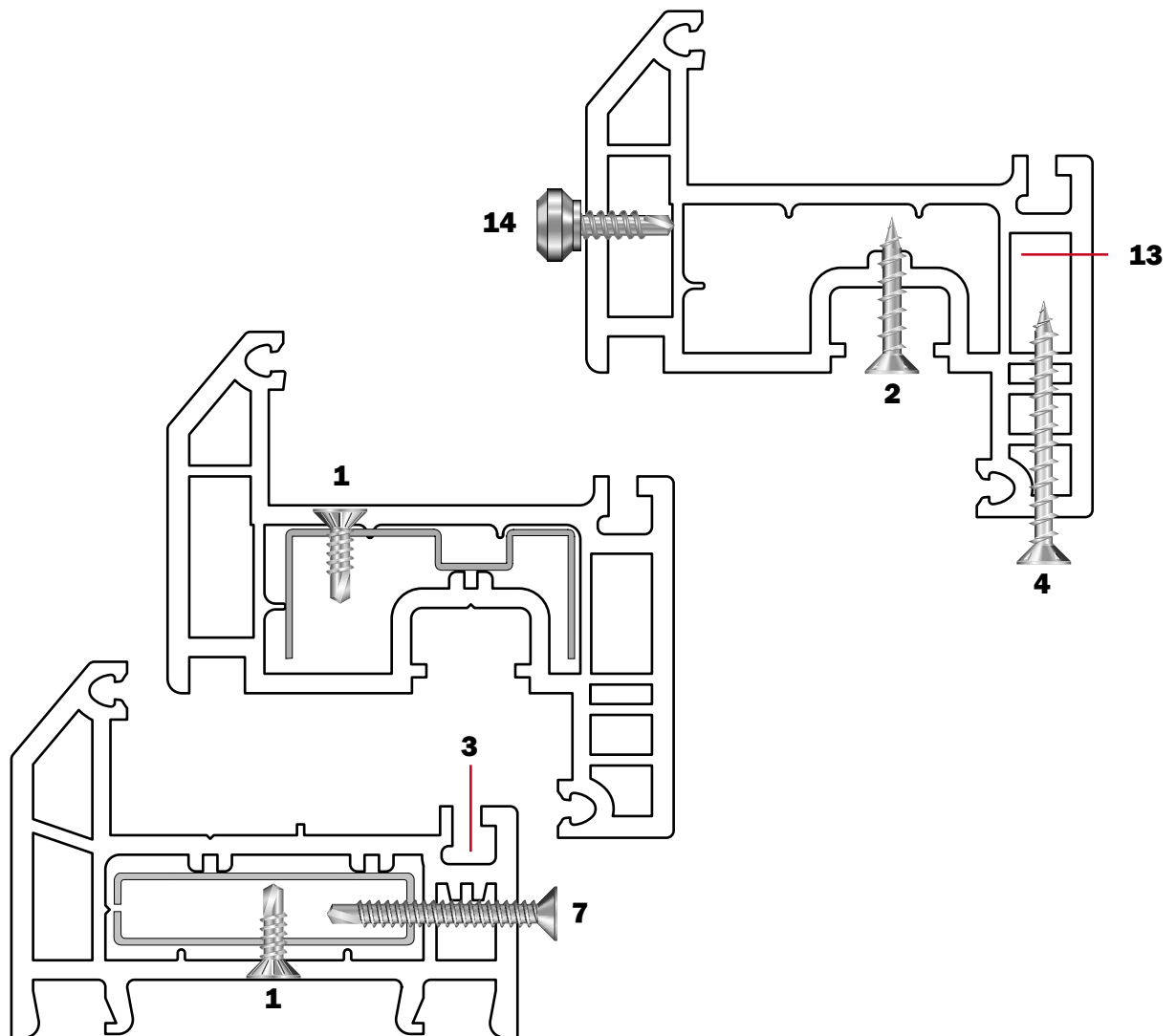
**15**





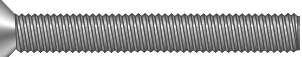

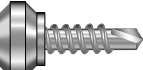


CPF 5.0 x 70 Z Dummy Vent to Frame

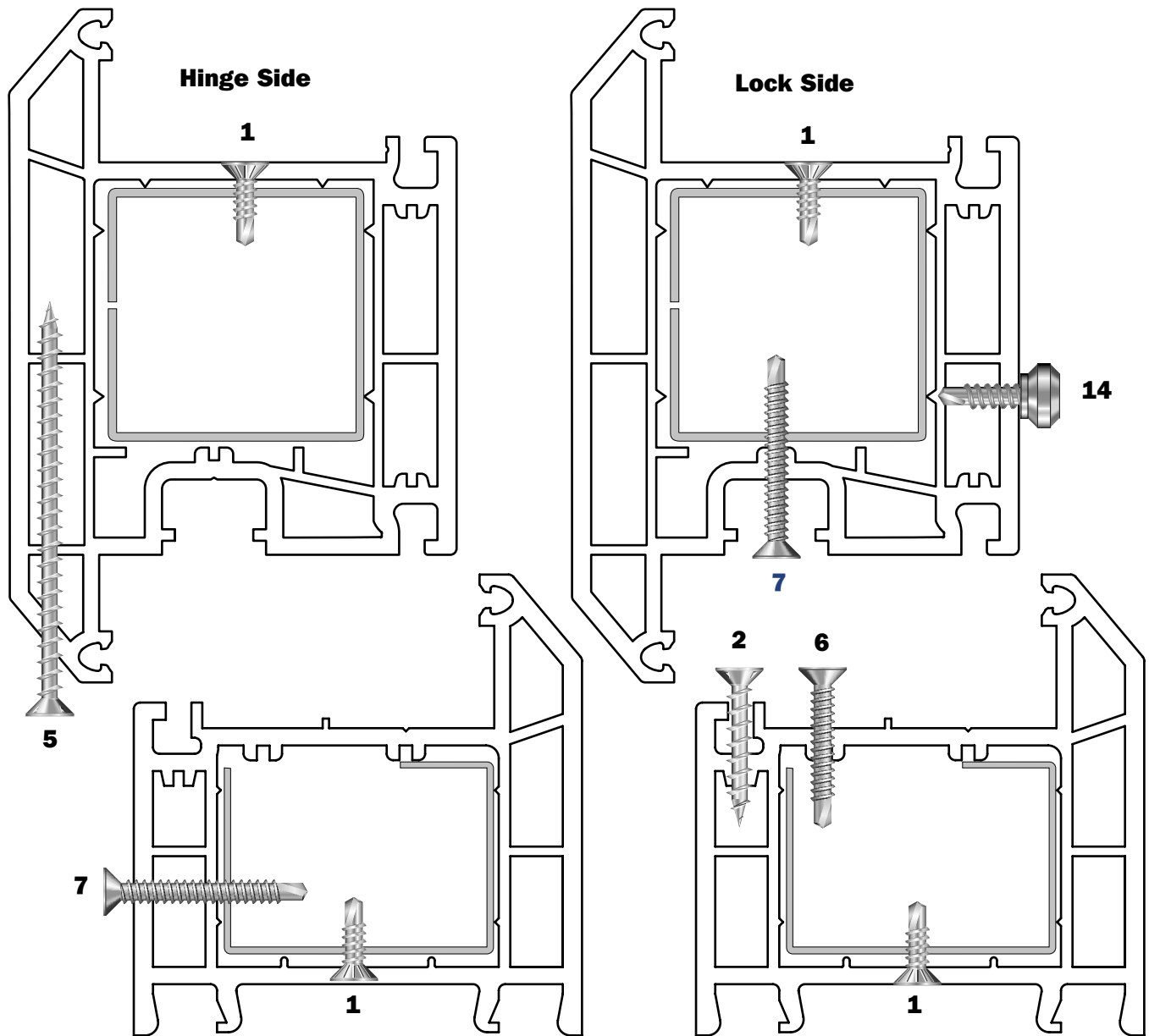


## Tilt & Turn Window - Reinforced



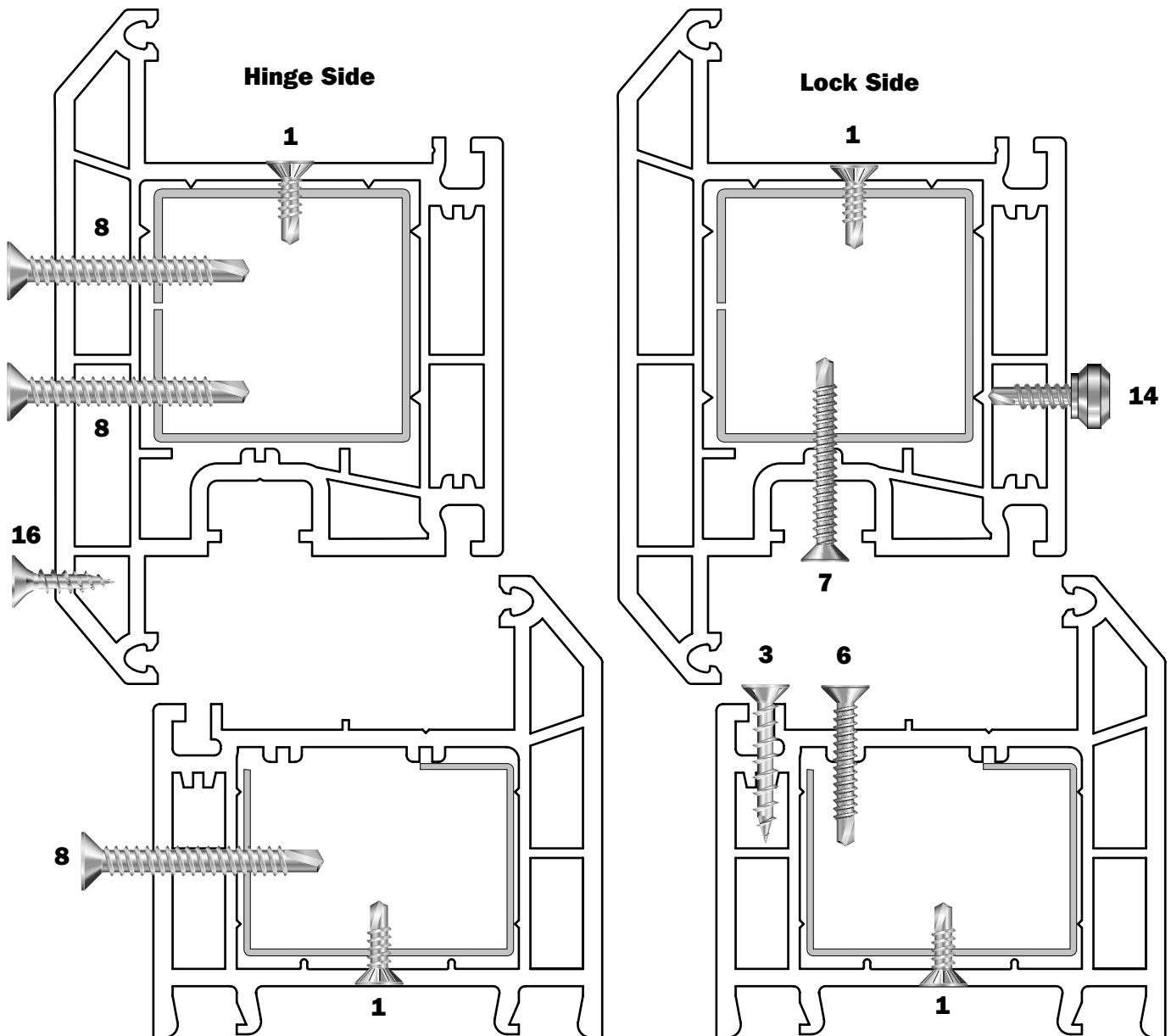
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|-----------|---|---|
| <b>1</b>  |  | <b>RSR 3.9 x 13 Z</b> Reinforcement Retention |
| <b>2</b>  |  | <b>CFG 4.3 x 22 Z</b> Gearing                 |
| <b>4</b>  |  | <b>CFG 4.3 x 35 Z</b> Corner Hinge to Sash    |
| <b>7</b>  |  | <b>CSR 3.9 x 32 Z</b> Hinge to Frame          |
| <b>13</b> |  | <b>MS M5 x 40 Z</b> Handle                    |
| <b>3</b>  |  | <b>CFG 4.3 x 25 Z</b> Keep                    |
| <b>14</b> |  | <b>NSR 4.0 x 13 Z</b> Weatherbar              |





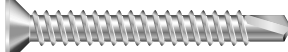


**Door - 'T' Sash - Butt Hinges**



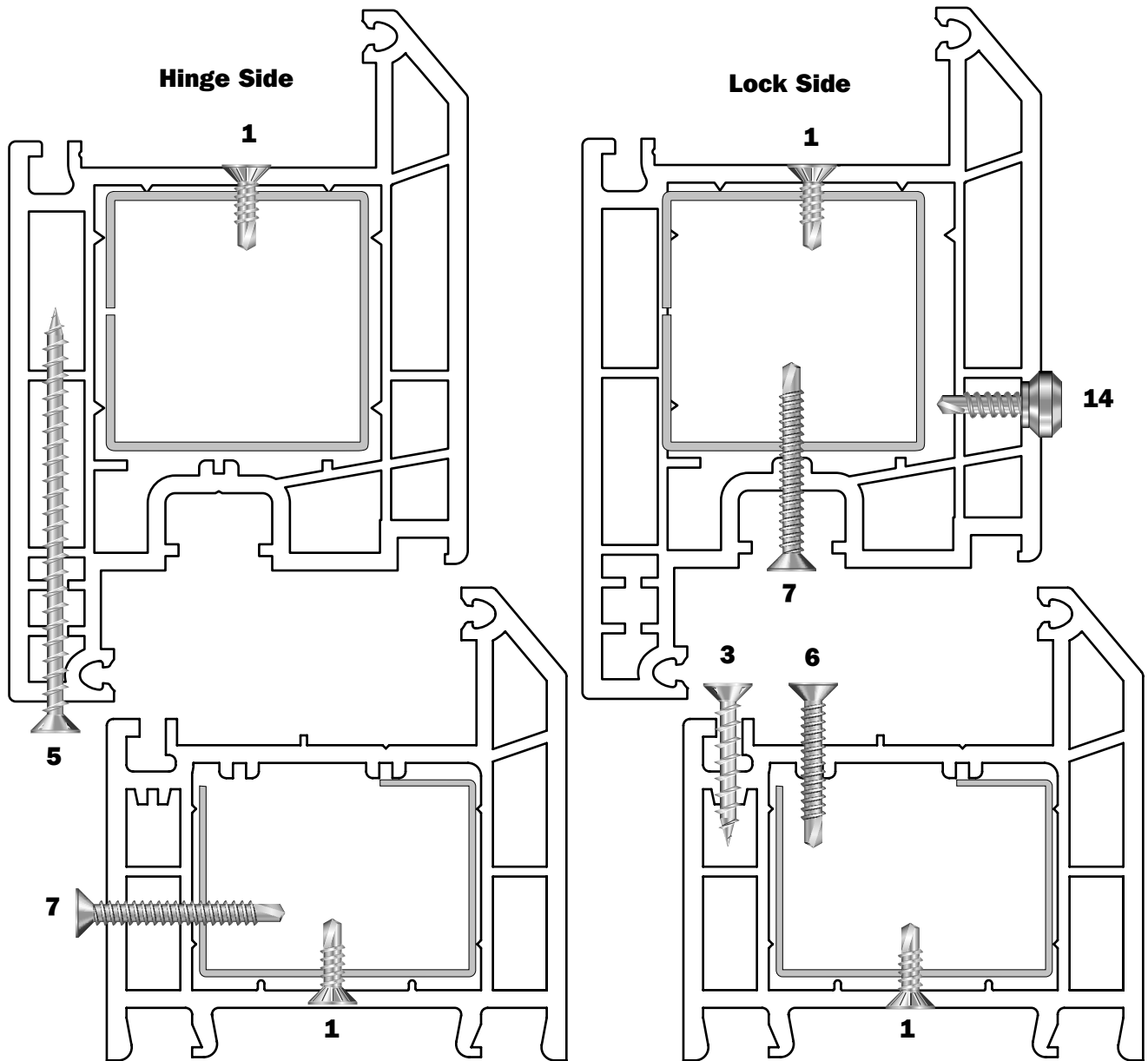
- |           |  |   |
|-----------|--|---|
| <b>1</b>  |  | <b>RSR 3.9 x 13 Z</b> Reinforcement Retention |
| <b>3</b>  |  | <b>CFG 4.3 x 25 Z</b> Keep                    |
| <b>6</b>  |  | <b>CSR 3.9 x 25 Z</b> Keep                    |
| <b>7</b>  |  | <b>CSR 3.9 x 32 Z</b> Butt Hinge to Frame     |
| <b>5</b>  |  | <b>CFG 4.3 x 65 Z</b> Butt Hinge to Sash      |
| <b>14</b> |  | <b>NSR 4.0 x 13 Z</b> Weatherbar              |



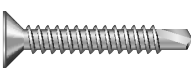


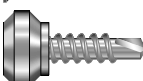
## Door - 'T' Sash - Flag Hinges



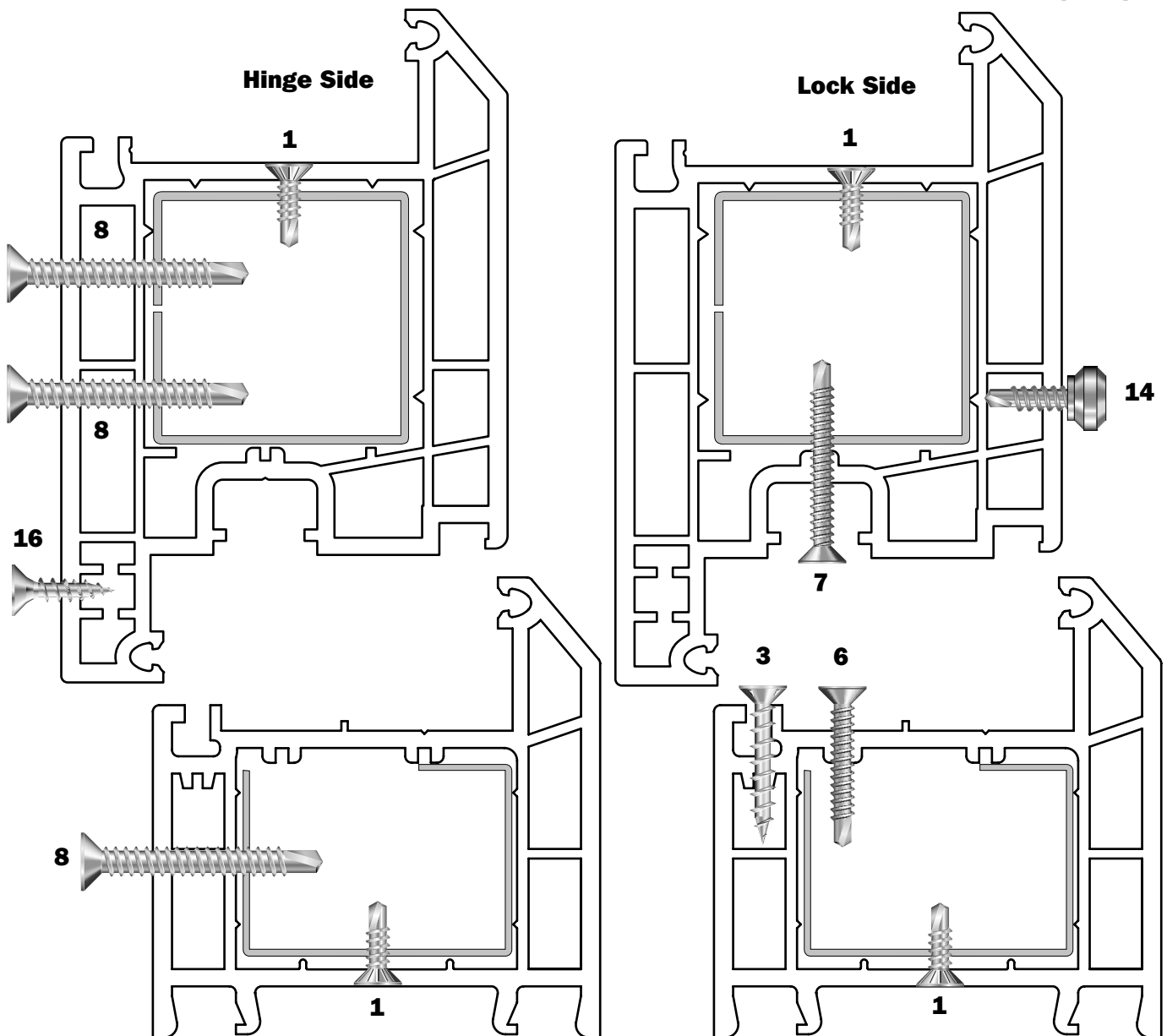
- |           |   |  |
|-----------|---|--|
| <b>1</b>  |  | RSR 3.9 x 13 Z Reinforcement Retention               |
| <b>3</b>  |  | CFG 4.3 x 25 Z Keep                                  |
| <b>6</b>  |  | CSR 3.9 x 25 Z Keep                                  |
| <b>7</b>  |  | CSR 3.9 x 32 Z Gearing                               |
| <b>8</b>  |  | CSR 4.8 x 38 Z Flag Hinge to Sash and Frame          |
| <b>16</b> |  | CPF 4.0 x 16 Z Hinge to unreinforced section of Sash |
| <b>14</b> |  | NSR 4.0 x 13 Z Weatherbar                            |





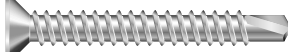
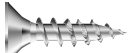

**Door - 'Z' Sash - Butt Hinges**



- |           |   |   |
|-----------|---|---|
| <b>1</b>  |  | <b>RSR 3.9 x 13 Z</b> Reinforcement Retention |
| <b>3</b>  |  | <b>CFG 4.3 x 25 Z</b> Keep                    |
| <b>6</b>  |  | <b>CSR 3.9 x 25 Z</b> Keep                    |
| <b>7</b>  |  | <b>CSR 3.9 x 32 Z</b> Butt Hinge to Frame     |
| <b>5</b>  |  | <b>CFG 4.3 x 65 Z</b> Butt Hinge to Sash      |
| <b>14</b> |  | <b>NSR 4.0 x 13 Z</b> Weatherbar              |

## Door - 'Z' Sash - Flag Hinges



- |           |   |  |
|-----------|---|--|
| <b>1</b>  |  | RSR 3.9 x 13 Z Reinforcement Retention               |
| <b>3</b>  |  | CFG 4.3 x 25 Z Keep                                  |
| <b>6</b>  |  | CSR 3.9 x 25 Z Keep                                  |
| <b>7</b>  |  | CSR 3.9 x 32 Z Gearing                               |
| <b>8</b>  |  | CSR 4.8 x 38 Z Flag Hinge to Sash and Frame          |
| <b>16</b> |  | CPF 4.0 x 16 Z Hinge to unreinforced section of Sash |
| <b>14</b> |  | NSR 4.0 x 13 Z Weatherbar                            |



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Application illustrations are 1:1 scale.