



APTUS[®]
concrete connections

PRECAST INSTALLATION GUIDANCE NOTES

2019

Purpose:

The purpose of this procedure is to ensure each connection is made with uniformity and consistency to ensure the integrity of the Aptus Coupler connection.

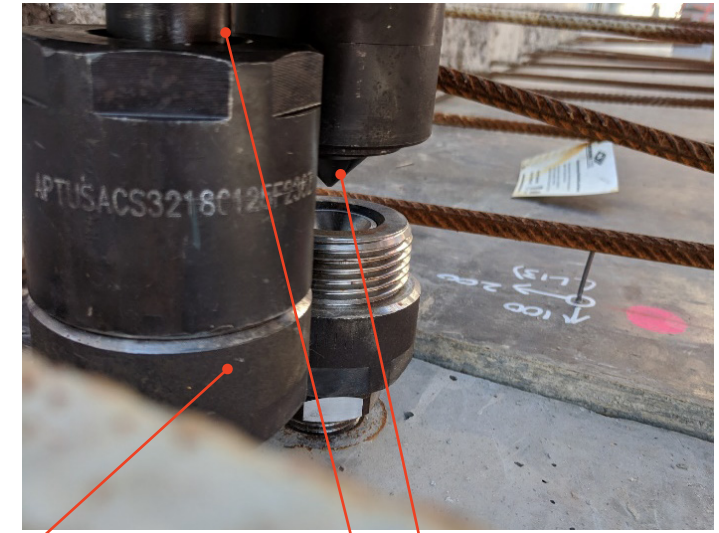
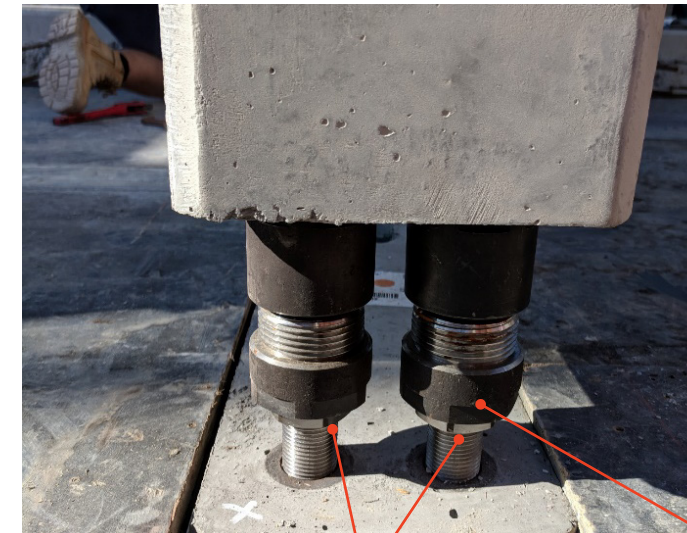
Definitions:

Definition of Snug tight as given in AS4100.

Snug tight- the tightness of a bolt achieved by a few impacts of an impact wrench or by the full effort of a person using a standard podger spanner.

APTUS Coupler Components

Outer Coupler



Lock Nuts

Inner Coupler

Seating Stud



Completed Connection

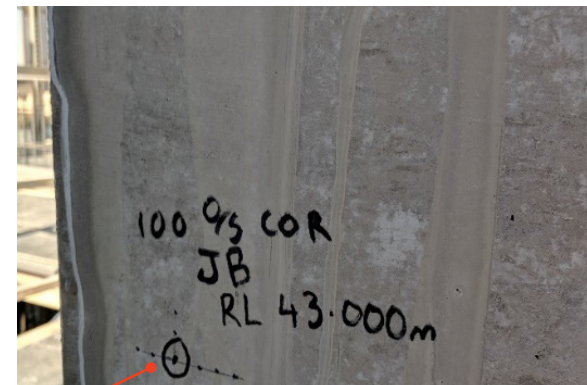
Outer Coupler

Inner Coupler

Lock Nut

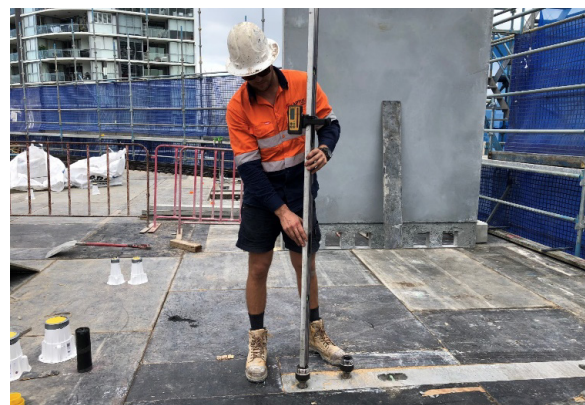
Preliminary Works to Precast Element Erection

Prior to the erection of the precast element the protective plastic caps are removed from the couplers. Select one of the corner assemblies to set to the nominated RL for the precast element. A reference RL is marked on site by the Builders Surveyor generally on part of the structure e.g. the lift core. All the lock nuts can be loosened and wound down to allow for adjustment when setting the couplers to the nominated RL.



Example of RL mark by the Builder's Surveyor

Once the selected coupler has been set to the nominated RL, the lock nut is tightened to secure it in position and a mark placed next to the coupler to indicate that it has been set to level. This coupler assembly is now fixed and is not to be adjusted any further throughout the erection process.



Mark to indicate which coupler is set to level – the "RL" coupler

Setting Couplers to Level

Step 1: From the coupler that has been set to the RL set the level of the adjacent corner coupler with the use of a spirit level.

Step 2: From the coupler that has been set to the RL set the level of the parallel corner coupler with the use of a spirit level or with the use of the laser level if the spirit level does not reach.

Leave the coupler on the last corner (and any other couplers) wound down below the level of the three couplers set to the correct RL. This prevents interference during the plumbing process. At this point the RL coupler is the only one to which the lock nut has been tightened.

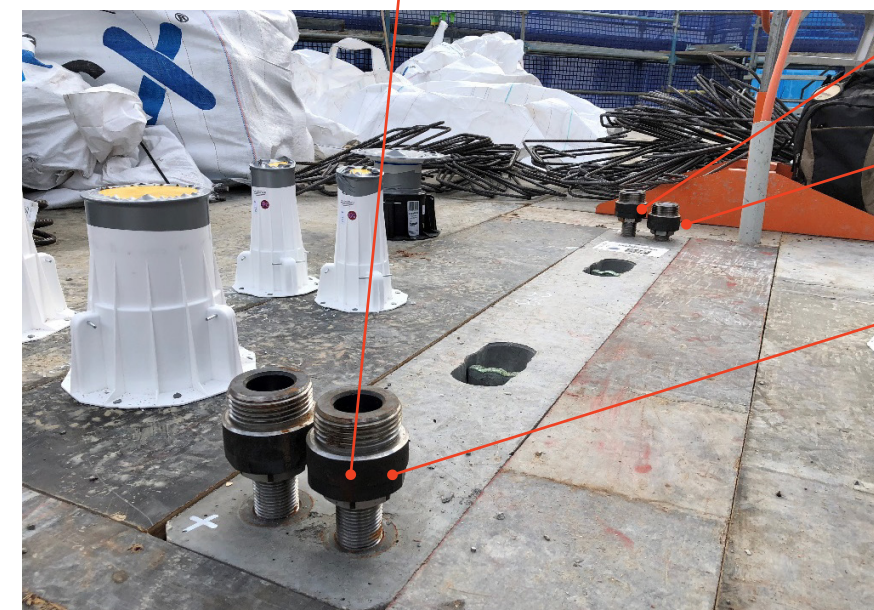


IMPORTANT NOTE:
Only three couplers are used to plumb the precast element.

Setting the level of the adjacent coupler from the RL coupler.

Adjacent Coupler

RL Coupler



Parallel Coupler

Corner Coupler (and any other remaining couplers) are set down below the level of other couplers.

Adjacent Coupler

After the couplers have been set, a chalk line is marked between the offsets that have been set by the site surveyor. This line will be used to set the precast element position during the erection process.



Offsets marked by the site surveyor.

At this time, the previously erected precast element below can also be checked to determine its position.



Any adjustment required to be considered can be incorporated during the forthcoming steps when erecting the next precast element.

Precast Element Erection Process

PLACEMENT OF THE PRECAST ELEMENT



The precast element is craned into position under control of the site dogman with directions being given by the precast erection supervisor.

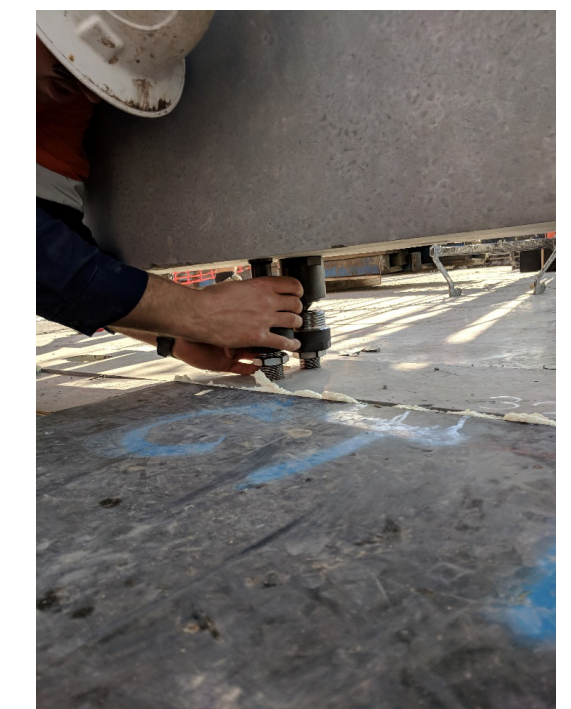


The precast element is lowered until the seating studs come into contact with the inner couplers. The precast element now will be sitting on three couplers only.

NOTE: The locating pin on the seating head prevents the precast element from slipping sideways off the inner couplers.



The outer couplers are screwed hand tight onto the three "seated" inner couplers which were previously set to level.



Precast Element Erection Process cont'd



The corner coupler (and any other remaining couplers) remains screwed down and disengaged so as not to interfere with the plumbing process.

POSITIONING & PLUMBING THE ELEMENT Always start on the narrow face first!

Above Left: Once the couplers have been screwed down the dogman can instruct the crane operator to take a little load off (ensuring the weight of the element is sufficiently "resting" on the three couplers).

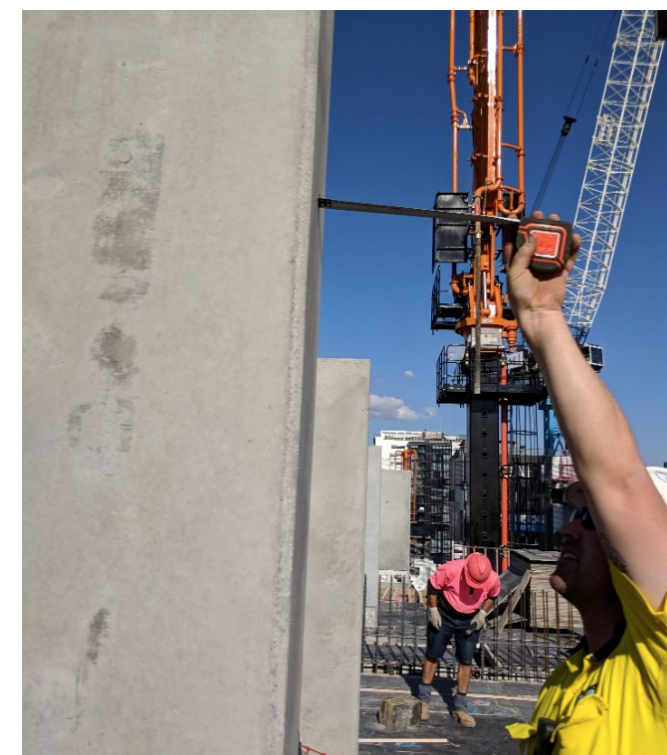
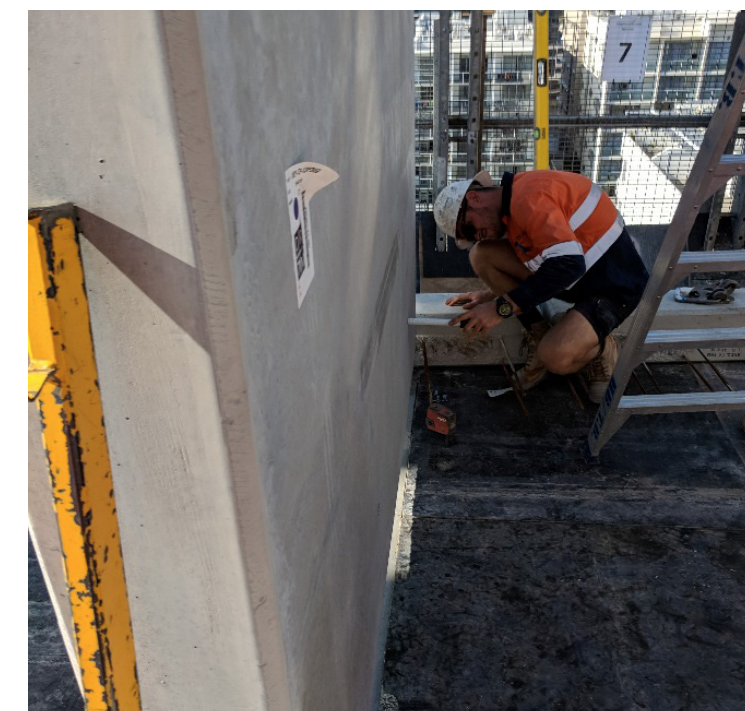


The base of the narrow element is checked against the surveyed off-sets. The lateral tolerance in the coupler allows for minor adjustment if required.



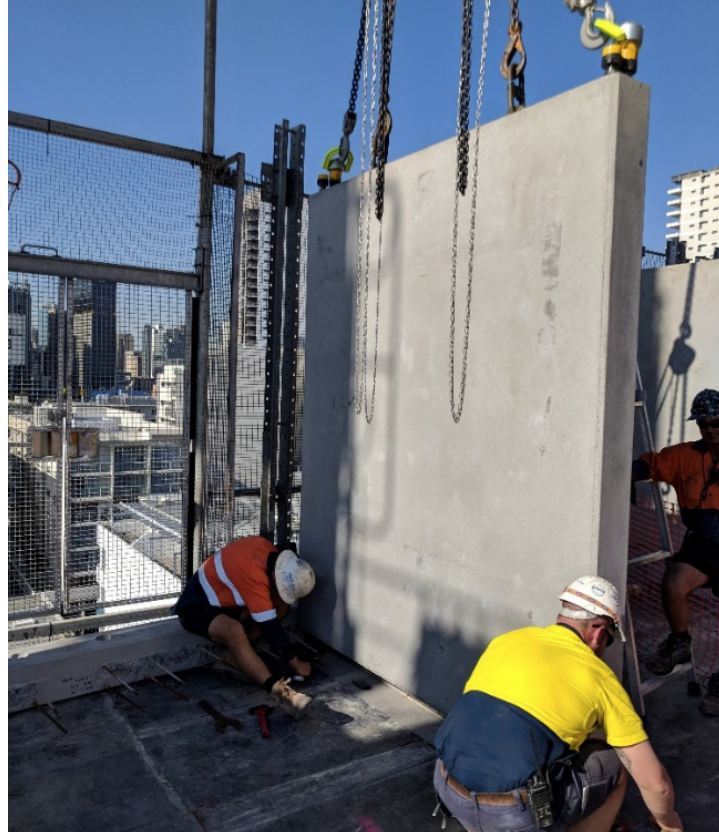
The vertical alignment of the narrow face is to be achieved by adjusting the "parallel coupler" up or down until the desired position is achieved. This is measured by the use of a laser level or spirit level.

Precast Element Erection Process cont'd

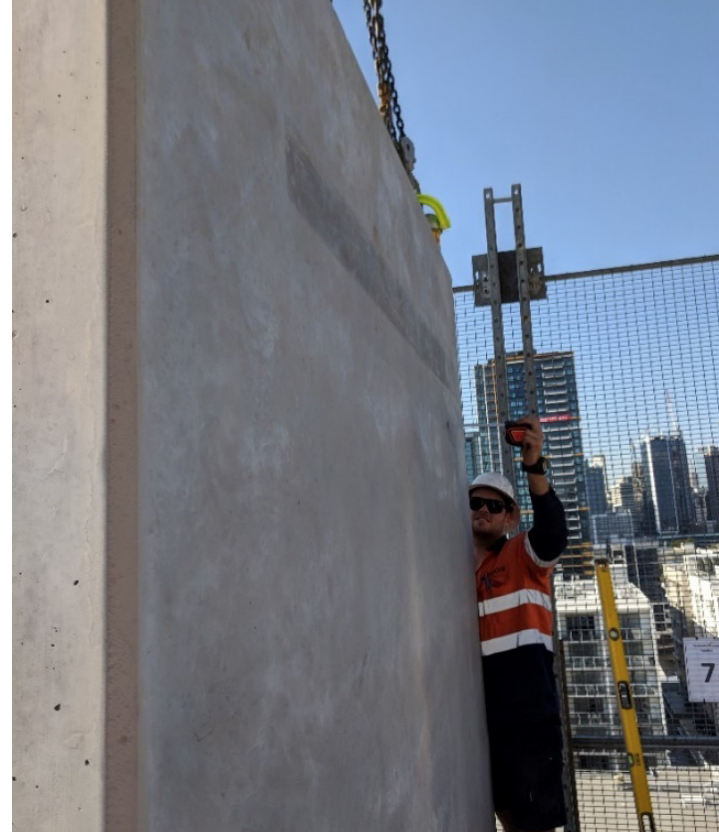


The base of the precast element is then checked for parallel to the surveyed offset lines along the broad face. The lateral tolerance in the coupler allows for minor adjustment if required.

Precast Element Erection Process cont'd

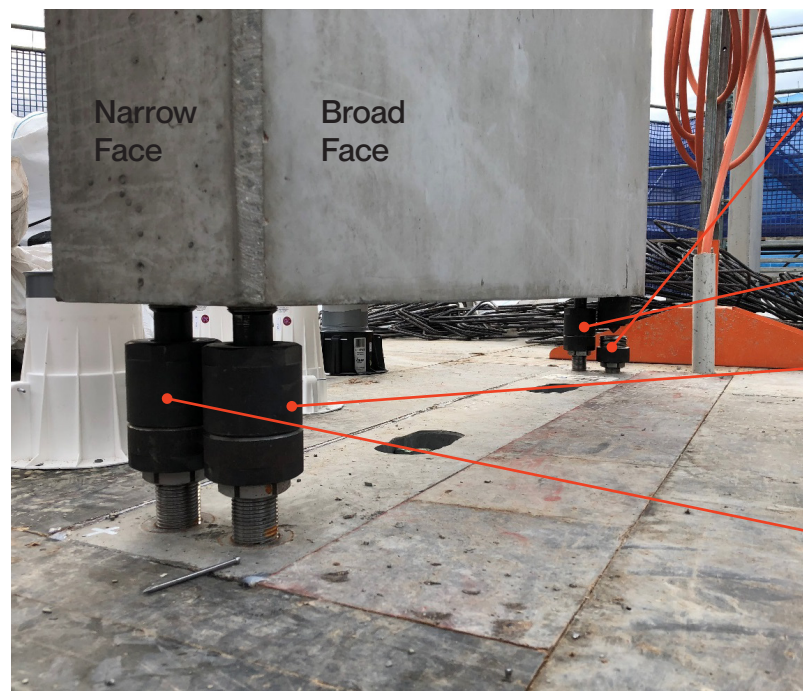


Once the broad face side is in the correct position, tighten and lock off the "RL" and "Parallel" couplers by fully engaging the Inner & Outer Couplers and then tightening the lock nuts.



The vertical alignment of the broad face is then be achieved by adjusting the "adjacent coupler" up or down until the desired position is achieved. This is again measured using a laser level or spirit level. The "adjacent coupler" is then fully engaged and secured by tightening the lock nut in position.

In summary, the precast element is erected and plumbed using three couplers only!!!
Remaining couplers are engaged only after the plumbing process is completed.

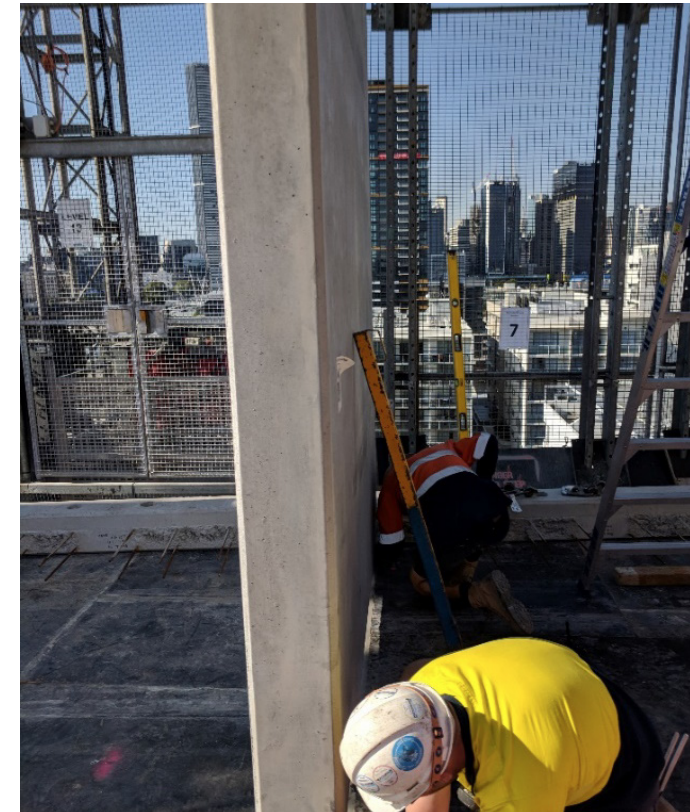


This coupler remains loose until the precast element is plumb. Once the precast element is plumb this coupler can be engaged and tightened.

1. The parallel coupler is raised or lowered to plumb the precast element on the narrow face
2. The adjacent coupler is raised or lowered to plumb the precast element on the broad face

The locked in RL coupler is to remain fixed at all times

Precast Element Erection Process cont'd



Now that the element is positioned and plumbed, all remaining couplers can be fully engaged. Two spanners are used, one to hold the inner coupler in position while the other tightens the outer coupler. All components are tightened to snug tight.



SECURING THE ELEMENT

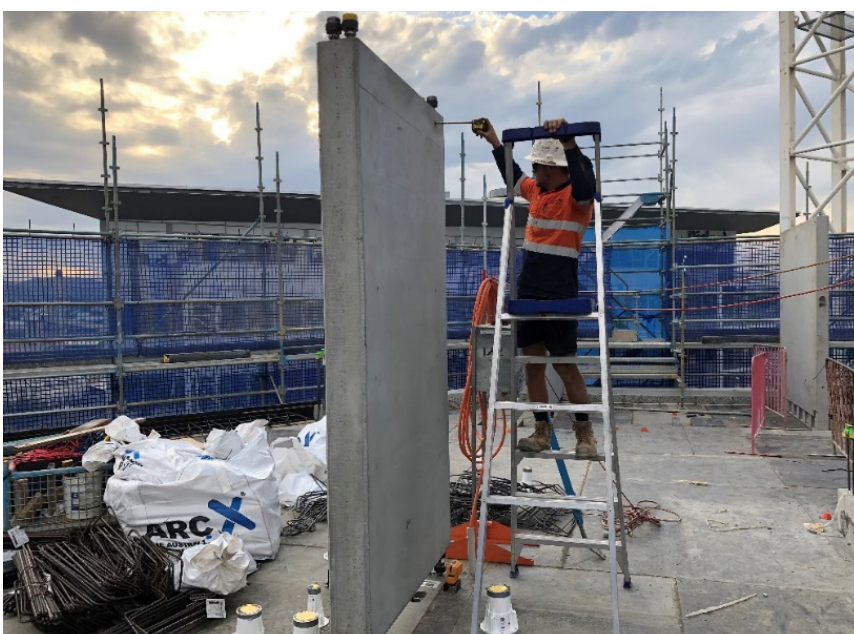


The final step is to ensure lock nuts are tightened and secured against every coupler on the element. This is also done with two spanners, one to hold the coupler in position and the other to tighten the lock nut. All components are tightened to snug tight.

Precast Element Erection Process cont'd



Once all coupler assemblies have been tightened the precast element erector will instruct the dogman to release the crane.



After the crane has moved away, a double check on the precast element may be undertaken.



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