



Representation & Advocacy

July 2018

To Members,

As those of you who attended the recent Members' Meeting in Melbourne would know, there is currently discussion taking place within the BD-066 committee (AS 3850) with regards to edge lifters which require a tension bar to develop their WLL.

To ensure our representative on BD-066 continues to represent the opinions and interests of the National Precast membership we are seeking your input. The current change concerns the additional requirements for tension testing of lifting systems that require component reinforcement, see extracts from AS 3850.1 below.

Please respond to [Sean](#) with your preferred proposal by COB Wednesday 11th July.

In summary, the discussions centre around the capacity requirements of lifters, without a tension bar, 3 alternative proposals have been discussed:

Proposal 1: The edge lifter shall be rated so that it can (with a Factor of Safety (FoS) of 2.25) perform at the stated WLL, WITHOUT the tension bar.

Comments:

In this proposal the edge lifter is to be an integrated tension system, ensuring the anchor will be installed as supplied and eliminating the risk of omitting component reinforcement (due to human error) during installation. The result will ensure the anchor will always have the required FoS of 2.25 and therefore perform as required when installed. The only chance of human error would be if the anchor was omitted and this would be quite evident as the precast panel would not be able to be lifted in the factory. Essentially this proposal seeks to eliminate the potential consequences of human error. As it currently stands, if the tension bar is missed, the precaster could be responsible for all damages caused by the error. A change of the anchor, to align with this proposal, could shift the responsibility away from the precaster.

Potential impact on the industry:

- Limitations on the WLL would require some lifters in current use to either be increased in length or their WLL reduced.
- An increase in the cost of anchors, approximately 15% - 100% depending on supplier.

The counter argument to this is that, precasters are sufficiently aware of the critical nature of this bar, are accustomed to controlling their installation, and its' exclusion is highly unlikely. Therefore, precasters shouldn't need to purchase more expensive lifters. There is potential for this approach to have a flow on effect to eye anchors, and if so current eye anchor style lifters would not be able to meet this requirement and could not be used, ruling them out as a lifting solution.

Note: National Precast would have to be prepared for this possibility and advocate against any actions detrimental to the industry in this regard.

Proposal 2: The edge lifter shall be rated so that it can (with a FoS of 2.25) perform at the stated WLL, WITH the tension bar. As well, the edge lifter shall ALSO be tested so that it can (with a FoS of 1.2) perform at the stated WLL, WITHOUT the tension bar.

Comments:

This proposal can be seen as a compromise between proposals 1 and 3. This proposal assumes that the manufacturers of precast elements will, when specified by the lifter manufacturer, always correctly install the lifter and tension bar. It would require an edge lifter with integral legs to be installed with a tension bar, however if the tension bar is omitted due to human error, the lifting insert will still have the full capacity intended, but with a reduced FoS of 1.2.

Potential impact on the industry:

- Limitations on the WLL would require some lifters in current use to either be increased in length or their WLL reduced, however less than in proposal 1.
- An increase in the cost of anchors, however less than in proposal 1.

The counter argument to this is that the lifting system should always have a FoS of 2.25. It must be consistently rated and comply with the factor of safety of 2.25 as stated in other sections of the standard, and the standard should not sanction the use of anchors with a lower factor merely to cater for installation error. Again, there is a potential for this approach to have a flow on effect to eye anchors, and if so, it is questionable as to whether current anchors would meet this requirement without significant modification to their design.

Note: National Precast would have to be prepared for this possibility and advocate against any actions detrimental to the industry in this regard.

Proposal 3: The edge lifter shall be rated so that it can (with a FoS of 2.25) perform at the stated WLL, WITH the tension bar.

Comments:

Under this proposal there is no requirement to test the capacity of the lifter without the tension bar.

This proposal assumes that when specified by the lifter manufacturer, manufacturers of precast elements always correctly install the lifter and tension bar. The tension bar is a critical part of the lifter system and integral to its success. It is reasonable to expect that precasters are sufficiently aware of the critical nature of this bar, are accustomed to controlling their installation, and its' exclusion is highly unlikely. It also assumes it is reasonable to permit the use of component reinforcement to allow a lifting anchor system to achieve the required FoS of 2.25.

Short edge lifters would be eliminated by specifying a minimum embedment length, where the standard could state, "Plate type edge lift inserts which are used for the rotation of precast elements shall have a length not less than 2.5 times the insert width." This would include all the currently used inserts and provide sufficient embedment depth to resist the rotational forces and at the same time provide useful breakout strength. There would be no potential flow on effects onto eye anchors.

Potential impact on the industry:

- No change to how the industry currently operates.

The counter argument to this is that human error could result in multiple loss of life but can be easily and cheaply eliminated. It could be argued that any change that will prevent this is a legal duty of care.

Extracts From AS 3850.1

2.5.2.2 Additional requirements for tension testing of lifting systems that require component reinforcement

Where a plate style edge lift insert is used, it shall have component reinforcement (tension bar) fitted and incorporate integral tension legs.

Edge lift inserts shall be tested in accordance with Appendix A, both with and without a tension bar.

The ratio R_u with tension bar/ R_u without tension bar shall exceed 1.1 for a minimum concrete strength of 25 MPa at the time of test.

Where component reinforcement is required, it shall be in accordance with AS/NZS 4671. The bending of reinforcing bars shall be in accordance with AS 3600.

NOTES:

- 1 All edge lift inserts and some other inserts may require component reinforcement and details should be obtained from the suppliers of these items.
- 2 If lifting inserts rely on component reinforcement, the size, shape and orientation of the bar should be specified in the manufacturer's documentation.

C2.5.2.2 While the tension bar is part of the overall lifting system, the additional anchorage provided by it into the element can act as an integral anchorage to the lifting insert in circumstances where manufacturing error may not have properly anchored the lifting insert into the element (see Figure C2.5.2.2).

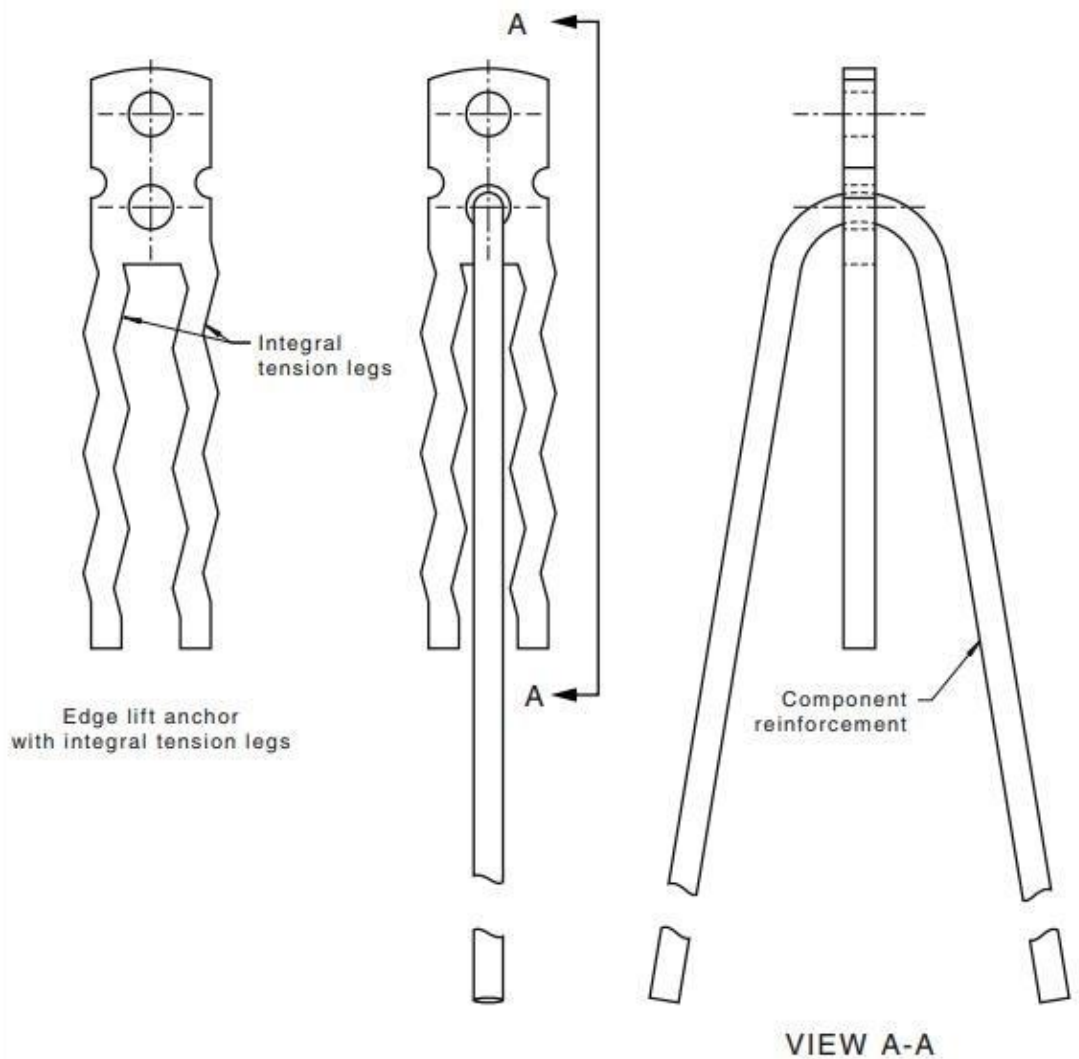


FIGURE C2.5.2.2 TYPICAL EDGE LIFT INSERTS WITH COMPONENT REINFORCEMENT



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