

**Concrete Slabs**

DECON® Studrails have been designed to reduce formwork and labor costs by:

- Eliminating column capitals and stirrups.
- Permitting more efficient use of fly-forms.
- Reducing installation time and effort versus conventional rebar stirrups and hairpins.
- Reducing congestion around slab-column connections, allowing quicker installation of conduit, PT tendons and other embedments.
- Using jobsite ready factory fabrication to guarantee weld quality, proper dimensions, correct spacing, and enable location/type color-coding.



*Easy location of DECON® Studrails to flat slab formwork at column locations. They enable drop panels, beams and column capitals to be removed from the design.*



*Simple geometry of DECON® Studrails enable PT tendons to be easily placed*

DECON® Studrails provide safe, efficient, engineered solutions by:

- Distributing forces over a greater critical section to prevent punching shear.
- Providing higher ultimate strength and more ductile behaviour of the concrete slab.
- Developing the full yield strength of the studs in tension, eliminating slippage, and enabling thinner post-tensioned slabs.
- Providing predetermined stud locations, virtually eliminating field placement errors.
- Allow greater versatility in design.
- The use of special chairs to maintain verticality of the studs and to ensure proper top and bottom concrete cover.
- By providing a stress path they enable punching shear control at slab-column connections with openings.



*DECON® Studrails greatly reduce reinforcement congestion in thin PT slabs*



*DECON® Studrails can simply be placed alongside openings to create a continuous stress path to the column.*



*Typical finished layout of DECON® Studrails, rebar, and PT tendons at column/slab interface*

**Raft Foundations**

By installing DECON® Studrails in raft foundations, you can:

- Increase the punching shear capacity at the base of columns, as well as in pile caps.
- Enable a significant reduction in slab thickness.
- Produce substantial savings in material, excavation and pumping costs.
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DECON® Studrails have been extensively tested and are a proven, cost effective solution to punching shear. They currently provide unmatched punching shear enhancement in thousands of buildings located in North America and over 30 countries around the world. Within North America, DECON® Studrails have been used in a wide variety of buildings from Miami, FL to Anchorage, AK. Projects have included condominiums, office buildings, hotels, casinos, parking garages, hospitals and other buildings as diverse as houses and storage silos.

The performance of DECON® Studrails are independently verified by ICC ES Evaluation Report ESR-2494, and meet the requirements of ACI 318-05 11.11.5, ACI 421.1R-08, CSA A23.3-04, IBC 2006, and IBC 2009.

**Seismic Performance**

During an earthquake, rapid deterioration of the concrete slab can result if proper shear reinforcement is not provided. Under cyclic loading, unbalanced moments are transferred from the slab to the critical section around column capitals. These connections have been proven to fail in an explosive manner during those load reversals.

DECON® Studrails are superior in withstanding these moments, and maintain connection stability long after other systems have failed for the following reasons:

- They absorb energy with their ductile behaviour.
- Lab test results show they provide superior ductility and lateral drift capacity when compared with conventional stirrups.
- Test results clearly show that they can maintain strength in the connection due to the secure anchorage provided by their special head design.
- They resist the development of punching shear cracks.

Due to their increased energy absorption and higher drift capacity DECON® Studrails can be a vital component for concrete structures located in seismic regions.

