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iNFORMER

YOUR QUARTERLY FRC NEWS & TECHNICAL UPDATE FROM iNFORCE

PROJECT SHOWCASE: NORTH HARBOUR WASTE SORTING FACILITY

THE PROJECT

Commissioned early this year, this waste management facility in Silverdale has been put to work sorting waste from the North Harbour region.

The team at iNFORCE were engaged by Coresteel to help design a floor slab that could handle heavy duty traffic from waste sorting machines and the corrosive effects of waste items.

“ With a combination of steel fibre and steel mesh reinforcement, we were able to create a seamless floor that corrosive material couldn't penetrate.



HOW WE HELPED

The team had to ensure the floor slab didn't have joints where corrosive material could enter and cause issues.

Our team got to work to design a hybrid slab that was entirely jointless and fit for purpose.

With a combination of steel fibre and steel mesh reinforcement, we were able to create a seamless floor that was unrestrained from the building structure.

Our design team used the reinforcing fibre to provide the necessary load-bearing capacity, combined with steel mesh in the top 40mm of the slab to give additional crack control.



NO JOINTS, NO PROBLEM: MOTUEKA TIMBER STORAGE WAREHOUSE



THE PROJECT

Back in early 2020, our team worked with AMK Engineers to design a warehouse floor for a timber storage warehouse in Motueka.

HOW WE HELPED

With the constant traffic from forklifts and heavy packs of timber being shifted across the surface, we opted to go with a design using steel fibres. This would mean sawn joints could be completely removed from the floor. By designing large floor panels interconnected with steel armoured joints, we were able to remove two issues in one go. Not only do sawn joints cause a long-term maintenance issue, but they also create a weak point in the slab that we would normally have to design around.

“ We’re pretty pleased to be using a good product here, and we’re looking forward to the benefits of having a nice floor surface with no saw cuts, providing smooth running for our forklifts.

- Matthew Trewavas, MLC
Operations Leader

The slab was constructed once the building was enclosed, meaning it could be constructed in a controlled environment. This minimised the effect of significant temperature changes & wind that can lead to dry shrinkage cracking.

KEY STATS

- Preparation time was reduced by 1/3 compared to traditional steel mesh
- Zero joints = smooth travel for materials handling equipment
- Jointless design for long-lasting protection against corrosion



CAN THE CORROSION: BALLANCE FERTILISER, DANNEVIRKE

For this fertiliser storage shed in Dannevirke, we used a steel fibre reinforcement to completely eliminate the need for steel mesh.

This ensures that any corrosion is limited to a single fibre as opposed to corrosive elements making their way through a saw cut and into the steel bars, which can corrode entire areas of reinforcement, which leads to oxide jacking, spalling and severe cracking.

Our team were proud to be able to provide an excellent solution that met the desired outcomes of our client.

TECH TOOLBOX: UNDERSTANDING THE IMPORTANCE OF LOAD TRANSFER AND JOINTS IN A SLAB

WHY CARE ABOUT JOINTS?

We often get asked why we put so much emphasis on joint layout and joint type in our slab designs. There's a specific reason for this: the joint is one of the weakest elements in a slab or pavement design.

Unless it's properly protected, the joint will become not only a major long term maintenance issue, but also a point in the slab that creates a rough and noisy crossing for your materials handling equipment.

THE EFFECTS OF POORLY DESIGNED JOINTS

Adequate load transfer at the joints in the slab is critical to the long term durability of the overall floor.

Poor load transfer means that adjacent panels will deflect independently under an applied load, producing an uneven floor. This in turn will cause further

damage to both the floor and material handling equipment.

HOW TO ADDRESS THIS ISSUE

In high movement environments, we recommend using a steel armoured joint.

These joints can open up sufficiently without creating a void that will cause unnecessary jolting or noise when trafficked by machinery. We have partnered with RCR Flooring and Permaban, one of the largest concrete construction product suppliers in the world, to provide our clients with the necessary support in ensuring their facility has the best possible jointing system that will serve its purpose for the lifetime of the building.

Don't leave it to chance: if you are constructing a new building, make sure adequate thought is put into the jointing layout and system. If in doubt, reach out to one of our team for advice.



WE LOVE LOCAL: iNFORCE SUPPORTS AIR RESCUE MISSION

One of iNFORCE's founding principles is to support Westport and the surrounding region and champion local community causes. Our team are proud to be supporting the Air Rescue mission, a critical service in remote areas like the West Coast of the South Island.



SMOOTH AS SILK: EXTERNAL STORAGE SLAB WITH INCREASED DURABILITY

iNFORCE provided a design solution for this expansive outdoor storage area in Palmerston North.

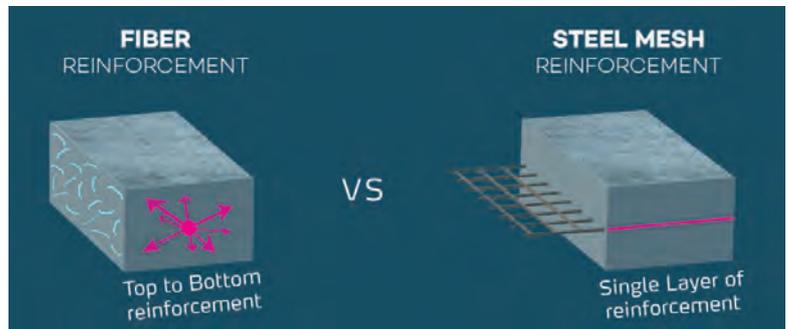
Designed for long term durability, the concrete slab was reinforced with fibre and designed with minimal joints to allow smooth travel for materials handling equipment.



FRC FAQ: IS A FIBRE REINFORCED SLAB STRONGER THAN A MESH REINFORCED ONE?

We often get asked **how can fibre reinforcing provide a stronger slab than traditional mesh reinforcing?**

The tensile strength of reinforcing mesh only comes into effect when it is bridging a macro (or visible) crack in the concrete matrix. On the other hand, short separate fibres provide a discontinuous, three-dimensional reinforcement that picks up and transfers load stress at a micro-crack level.



This means that fibres provide strength and help to control micro cracks, even before they form. This encourages higher ductility or toughness.

Additionally, using fibre provides three dimensional reinforcement from the top of the slab right through to the bottom, as opposed to a two dimensional single layer of reinforcement provided by mesh.

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