



**Companie(s) :** Freyssinet Australia Pty Ltd  
**Owner :** GrainCorp Operations Limited

**Subsidiary(ies) :** Freyssinet Australia

**Beginning of works :** 11/2010

**End of works :** 04/2011



### Description of the work :

In December 2009, the reinforced concrete wall of a 1200t grain silo failed, dumping an estimate 500-600 tonnes of grain on to the ground and rail assets adjacent to the silo. The grain silo, part of a collection of four silos capable of holding some 2700-2800 tonnes, is a crucial link for GrainCorp in Victoria's remote Wimmera-Mallee region. Due to the extent of the damage to the structure and visual indications of further deterioration beyond the failure region of the structure, the scope of works for the project included strengthening of the silo structure as well as the remediation of the existing concrete wall.

### Freyssinet mission :

Freyssinet's role on the project as head contractor included the removal and reinstatement of all steel reinforcing and concrete; design, supply and installation of external post-tensioning bands to reinforce the structure as well as the design, fabrication and installation of a new out loading chute, access ladder and platforms. Freyssinet completed both the external post-tensioning design as well as finite element analysis of the structure to determine the maximum allowable limits of the concrete break out – without propping - prior to the works commencing. Internal and external scaffolding was erected to provide access, followed by completion of the remediation works with the concrete reinstated using the wet-spray shotcrete method. Coring was completed through two 200mm thick reinforced concrete walls to enable continuity of the post-tensioning bands around the structure. In all, a total of thirty (30) external post-tensioning bands were installed, using custom PVC duct, 15.7mm high tensile, low relaxation strand and Freyssinet's X-Range (1X15) anchors. Corrosion protection for the external post-tensioning incorporated greased & sheathed strand, cementitious grout and calcium-based grease. Protection to the cast-iron anchorages was achieved using a UV-stabilised, resilient nylon coating. Despite the client delaying the start of the project due to prioritizing other works, the remediation and strengthening works were completed a week prior to Christmas in 2010, only a few weeks in to the harvest period ensuring that the repaired and strengthened structure could be utilized as required. In the coming months, the new out loading chute, access ladder and platforms will be fabricated and installed, completing the works successfully for GrainCorp.

