

# Shared Learning

COSTAIN

**The Thameslink Programme**

Issue Date: 25<sup>th</sup> June 2017 - For further info contact sharon.fink@networkrail.co.uk

**Issue Number: TLP078 Title: Lifting Anchor Failure**

## Overview of Event:

A set of 3t chain blocks and a 1.0m length of 20mm diameter Dywidag bar fell from a height of 5 metres (see Fig 1 below). No one was struck or otherwise injured. The lifting tackle (chain blocks) was suspended from a hook attached to a lifting anchor (a Dywidag bar system that involved the joining of 2No. bars together using a proprietary coupler in accordance with an approved design). The top of the Dywidag bar is cast into a concrete slab above the arch. The chain blocks are 1 of 4 sets of lifting tackle used to lift the shutters for the quadripartite arches. The lifting operation had been completed and the blocks were not being used to lift at the time that they fell.

## General Key Messages:

- Teams should make sure that details of engineering designs are understood and implemented in accordance with the designs
- Teams should make sure that they have assurance arrangements in place to check compliance with installations of designs
- Teams should engage with the workforce to check whether there are 'local' arrangements in place to manage issues that they observe whilst undertaking works

## Actions Taken As a Result of the Investigations:

- Brief to team that only CREs to administer changes and must be formally agreed in writing. The Just & Fair Culture process will be used if process is not followed.
- The Risk Readiness Reviews (RRR) agenda has been revised with experienced people in attendance.
- A prohibition on interim design (non-AFC) drawings
- Temporary works design to be included in the 'permission to commence construction' process
- System developed to introduce a design hold point system (reference in design drawings and ITP)
- Design & installation check points included in temporary works drawings
- Temporary works design to be in place and fully signed off preceding submission of WPP for acceptance (WPP to include references to design)
- Permit to load process reviewed
- A site wide communication was issued to raise profile of risks associated with lifting or load left suspended

Fig. 1 Chain blocks were in this position



## Causes:

**Immediate Cause** – the bottom length of Dywidag bar unscrewed from the top length causing the bottom bar and attached lifting tackle to fall. **Underlying Causes** :

**Organisation:** The anchor was not installed in accordance with design. The supervisor made a decision which was not checked or condoned by the engineer, to install the arrangement. Changes were not authorised. The failure to provide the supervisors with the requisite design drawings added to this error.

**Procedure:** The RRR did not identify the risk of confusion regarding positioning of different types of design details.

**Design / Procedure:** An AFC drawing was not made available to the installation team. This resulted in incorrect placement of Detail C anchors where Detail A should have been. There was programme influence involved in this cause.

**Procedure:** There was no inspection / check procedure to confirm each of the anchor details i.e. what type of Dywidag bar went where, some of the anchors were installed in the wrong position. The lack of an Inspection and Test Plan (ITP) type process to perform this assurance function was contributory. The Permit to Load process did not address the issues.

**Procedure:** The WPP / TBS did not adequately detail [using Hold Points] the safety critical installation, namely the use of cast in lifting anchors. Sequencing / positioning was not structured and there is no evidence of a coherent drawing being available.

**Communication:** The Senior Engineer briefed his Section Engineers in the detail of the lifting anchors. One Engineer fully understood the detail requirements, the other did not. The message was then not clearly transferred to the installation team.

**Procedure:** The Engineers did not identify after the pour that the Detail A (continuous length) Dywidag lifting anchors were not visible; this was possible to see.

**Procedure:** Contrary to good lifting operations practices, the lifting tackle was left suspended for 2 days after the quad was struck and without an Exclusion Zone in place. This exposed the lifting equipment to further disturbance and potentially external forces thus significantly contributing to the incident.