Screen Saver Innovations for One Blackfriars

Introduction

Brookfield Multiplex and St George commissioned research into a one off multi-directional adjusting perimeter climbing screen to provide a fully enclosed working environment for the duration of the build. Ischebeck Titan were able to meet the demanding specification set out by Brookfield Multiplex and St George for the One Blackfriars project. The structure is an interestingly shaped frame with sloping lines and curves. The slopes incline outwards around 5 – 7 degrees from ground to L32, then the slopes change direction turning inwards after L32 (Figure 1).

Figure 1: One Blackfriars Tower

Challenge

The challenge set out was to develop a screen solution to meet the following criteria:

1. The screen needs to increase in width as each floor plate is a unique shape and size.
2. Follow the incline of the building as closely as possible to varying angles and to be adjustable past the L32 incline and change in direction, to avoid large gaps from the screen to the building.
3. Use lightweight components to limit loads on the structure and manual handling issues.
4. Use minimal crane time to allow the screens to ascend the building.
5. Use mainly re-usable components that allow for the screens to be used on further projects.
6. Recycling of formwork with minimal manual handling and no reliance on crane hook time.

Solution

The design was based on Ischebeck Titan's Screen Saver product, with several new innovations designed to meet the specific needs of this challenging structure.

The specific innovations were;

1. Use of a "cranking screen" allowing the Screen Saver unit to bend around the worst L32 inclinations (Figure 2).
2. Use of in-situ sliding screen panels and platforms allowing for easy adjustment of the plan dimensions of the screens on the building (Figure 3).
3. Use of a "Smooth Mover" tool and a "Centurion" bracket allowing the standard needle beams to slide horizontally and change the inclination of the screens.
4. Introduction of a rack and pinion material hoist within the climbing screen.

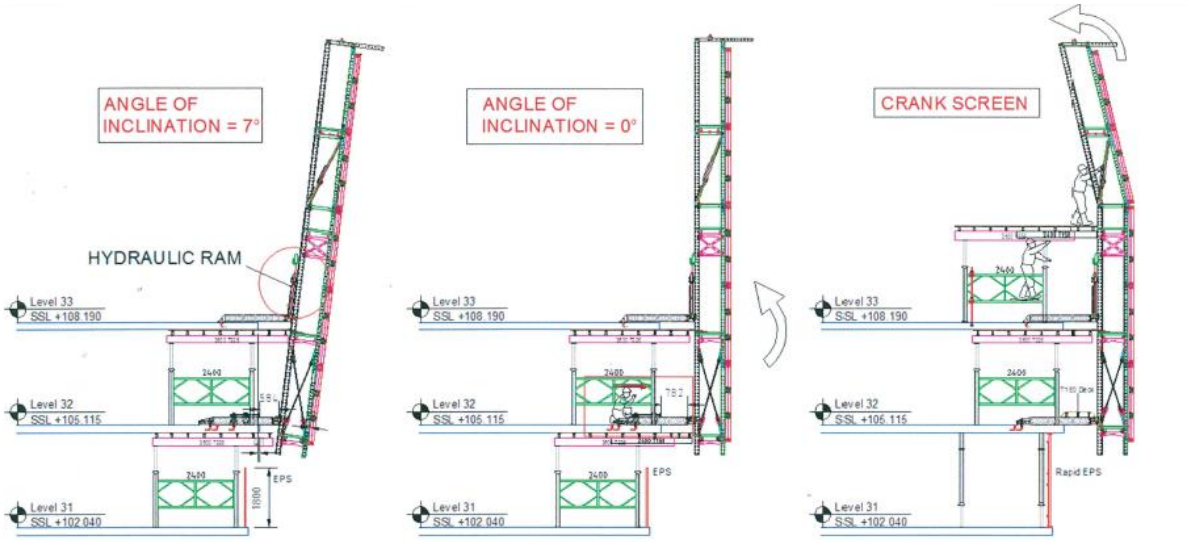

Figure 2: Use of "Cranking Screen"

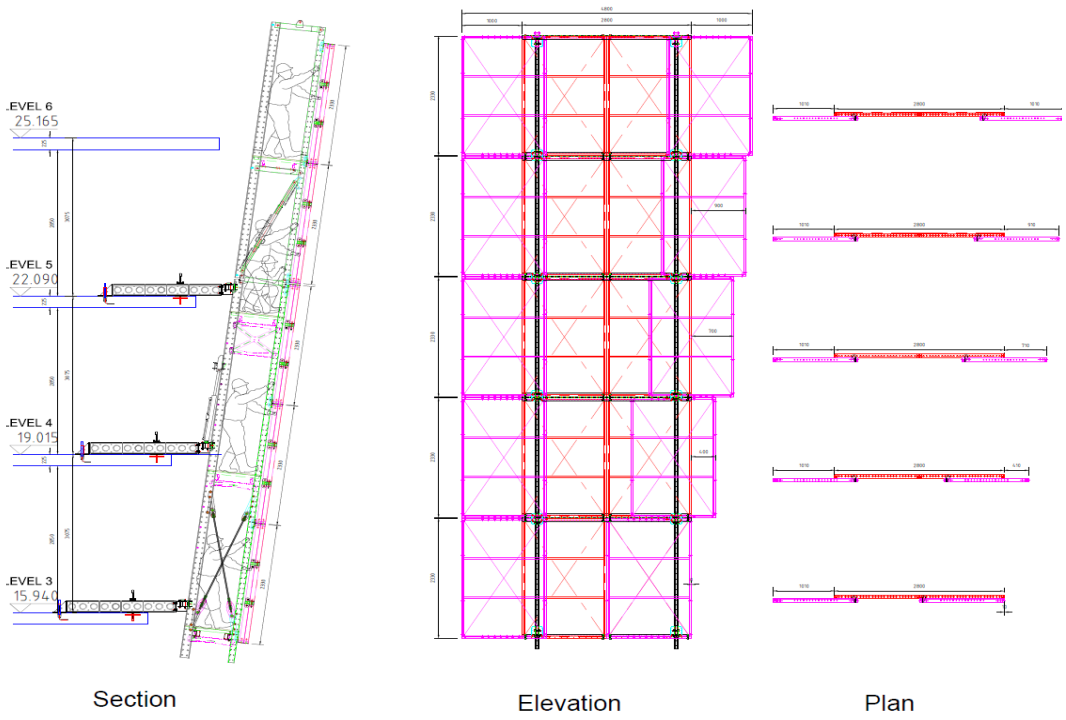

Figure 3: Panel Movement/ Platform

UK's 1st

This is the first time a multi-directional adjustable screen will be used on a building that allow adjustment on the vertical inline and allows for the growing and the concertina outwards to allow for the reduction of gaps(Figure 4). There are numerous patents on the screen.

For the first time in the UK construction industry a material hoist is being integrated into a climbing screen through Alimak Hek another UK first.

Figure 4: Climbing screen currently in place showing the sloped installation position

Beneficial impact on the construction industry

The innovations will allow for the concrete frame at One Blackfriars to be constructed behind 4 levels of Screening and external platforms, and considerably reduce the risk of falling and dropping materials. It will also allow it to be completed with minimal use of the crane and allow progress of the slabs to continue. Climbing screens are not a new concept, and the benefit of using them is recognised across the UK concrete frame contractors. The beneficial impact of these developments is that bespoke Climbing Screens solutions can be used as an industry standard for all the different challenging shapes of high rise structures that are being constructed on the London skyline.

The Screen Saver design has allowed for almost all of the total equipment used on this project to be suitable for re-use. The design innovations are generic for steering Screen Saver around curves and inclinations of all high rise structures and can be easily replicated. The investment Brookfield Multiplex and St George have made will be reused on many projects in the future. The innovations have delivered a sustainable approach and compared to many alternative solutions have not required a vast amount of special fabrications or extensive use of timber.