

### **Fast and accurate forming of distinctive architecture with easily assembled standard systems**

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#### **Elizabeth Quay – Island Walls, Perth, Australia**

The Elizabeth Quay is an exciting major development project by the State Government, which is located on the north shore of Perth Water (Swan River). This project seeks to revitalise Perth central business district and foreshore, in addition enhance the tourist industry in Perth by reconnecting the city centre with the Swan River. This multipurpose project includes construction of residential, office and retail buildings, as well as a pedestrian bridge, island and island retaining walls. A focal point of the project is a man-made island surrounded by a newly constructed inlet, and a key component of the island is a series of curved, sometimes also inclined, coloured concrete architectural feature walls.

The island walls were one of the most visually significant features of this project. After an extended design process using special components and multiple systems from various suppliers, the client eventually decided on an alternate method, and called upon PERI at the eleventh hour to provide a solution. The variable multiple radii, unique layout geometry and tight timeline made this project a challenging one, which was completely fulfilled by PERI formwork solutions. It was PERI's first major project involvement with Fremantle Construction

RUNFLEX was the wall formwork system chosen for the bulk of the work, but unlike normal projects where it is used (tanks, water treatment works etc.), there were no fixed radii curves anywhere in the project, thus templates had to be created for each and every use, and as a consequence, accurate panel placement was vital. Due to the few elements requirements and easily adjustable panels, the material and labour-costs were reduced. As a result of this simple forming process and fast concreting, the construction time decreased significantly compared to conventional circular formwork options.

# Press Release

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PERI engineers designed 35 pre-assembled standard RUNDFLEX panels in total with radius of 2.5m upwards, which could be adjusted to continuously changing radii. Moreover, in order to conform to the unique shapes, designs using up to three PERI formwork systems were sometimes required; TRIO, RUNDFLEX and VARIO with gusset plywood.

The culmination of the works was Wall 19 – a complex wall that tightly folded back on itself a number of times, and was also inclined for a significant part of its length. VARIO formwork would provide the basic alignment, with plywood gussets fixed to it to provide the final intricate shape. SB Brace Frames offered single-sided support to the VARIO formwork in areas where ties could not be used. Many weeks of intensive design work was needed for all the 3D modelling – CAD template files were provided to the client who used an off-site joinery to fabricate the various modules, which were then transported to site and mounted to the VARIO panels before installation.

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**Image 1**

Continuously adjustable for radii ranging from 2.5m upwards including standard working platform bracket; decking and guardrails were client supplied to provide the safety condition. (Photo: PERI)

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**Image 2**

Designing wall 19 with plywood gussets - Vario formwork would provide the basic alignment, with 3 layers of 6mm thickness plywood to provide the final intricately shaped formlining. (Photo: PERI)



**Image 3**

RUNDFLEX panels were designed separately for the specific length and subsequently templates were provided for each and every use. SB Brace Frames were used for some parts of the wall for the purpose of single-sided concreting where through ties could not be placed. (Photo: PERI)



**Image 4**

Adjustable PERI RUNDFLEX panels allowed construction of the reinforced concrete island walls to be achieved significantly faster than conventional formwork.

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