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STEEL CONSTRUCTION NEW ZEALAND MARCH 2008

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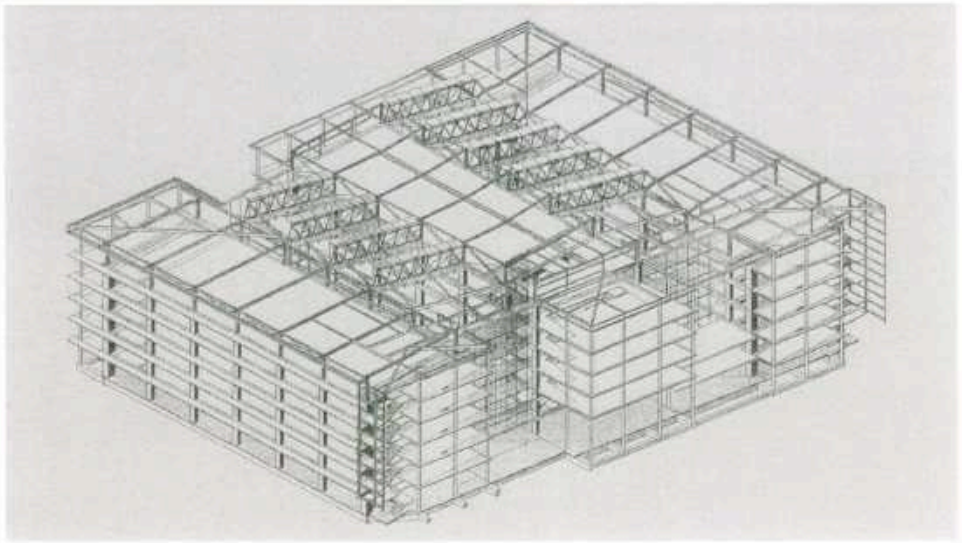
BANK OF NEW ZEALAND BERTHS AT HARBOUR QUAYS

CentrePort is developing 6.5 hectares of land fronting Wellington's Waterloo Quay into a business precinct of international standard. The design emphasis is on public space and permeability with low-rise buildings with large floor areas that support highly functional, flexible and integrated work environments. The Bank of New Zealand has enthusiastically taken its place at 66 Waterloo Quay, directly across the road from the Railway Station and next to the Bluebridge Ferry terminal.

The architecture by JASMAX Ltd is unique for New Zealand; drawing inspiration from the success of the NAB building in Melbourne's Dockland development, JASMAX has designed a building that has three piers linked by two full-height atria. JASMAX's John Dennehy: "Each Pier is a large building in its own right, with five floors of approximately 1000m² of office space per floor in piers one and three and six floor in the central pier. Because the piers are connected across each atrium by multiple bridge links, the building in fact offers more than 3000m² per level, and a total NLA in excess of 18,000m² spread over the five office levels. The ground floor of the building includes car parking, public access areas and retail units."

Structural Engineering was by Beca Carter Hollings & Ferner Ltd, whose Matthew Lander comments on the bridges connecting the piers: "The piers are seismically linked by 550 x 550mm SHS bridge beams, the largest of their kind in New Zealand. One option considered was to fix the beams to one pier but allow them to slide on the adjacent pier.

Above: An aerial view of the Bank of New Zealand's new building under construction at Waterloo Quay, Wellington. Below: The Beca structure as drawn by JASMAX on REVIT 3-D software.



However, we decided to pin the beams at both ends so that, in the event of an earthquake, the piers would move together parallel to the direction of the bridge span but would be free to move of their own accord at right angles to the bridge span. This was cost effective but also became an attractive feature as we left the pins of the knuckle joints expressed.

The box sections were concrete filled to increase their mass and therefore reduce vibration. The floors of the bridges are pre-cast planks and are connected to the steel box beams by shear studs."

The bridges have another function: the four glass facades of the atria are tied to the bridges at each level to help resist wind pressure. The entire glass façade, supplied by Thermosash Ltd, is suspended from large fabricated steel beams at roof level using steel rod hangers.

On the end bays of each pier, the steel beams are supported by slender circular columns that enhance the impression of lightness while creating more space for offices and meeting rooms. On the Waterloo Quay side of the building at the two outmost corners of the piers, two wing walls, again in structural steel, are suspended on one side only. They have the aesthetic appeal of elegance but are also functional; from ground floor to level five they support the stairs for fire egress.

An important feature of the building is the roofing of the atria, one of which is for public use and the other is exclusive to the BNZ. The designers favoured saw-toothed steel structures over the atria, with a three metre deep truss extending from pier to pier. "Instead of one very large and rigid diaphragm, which would have covered all three piers and been very expensive, "says Matthew Lander, "we connected these roofs

Above: The steelwork for the roofing of one of the piers.

Left: The three metre deep truss of the sawtooth skylights.

rigidly to the central pier, and then designed two full building length sliding joints. These allow for up to 750mm of movement in the roof at two locations, where the sawtooth skylights slide on piers one and three."

Evan Kroll, whose company Stevenson Structural Engineering Ltd, did the steel fabrication and erection, says 650 tonnes were required. "It's always exciting to be part of a team that's delivering a signature building. I especially enjoyed being able to sit down with Fletcher Construction, JASMAX and Beca and determine the most efficient way to fabricate the steel.

"The wing walls are a good example. Originally designed for bolted joints, we made them up in our workshop as two units five metres wide and 12 metres long. These needed only two lifts with Fletcher's tower crane, releasing it to move onto other work. It all adds up to more cost-effective construction for the main contractor and ultimately the client."

CentrePort intends to retain ownership of the buildings within Harbour Quays and has currently no plans to sell. The BNZ building and site will be managed by the in-house CentrePort Property Management team. Occupation is programmed for mid 2009.

Above: The steel-framed bridges that connect the concrete piers.

Left: At the end of each pier, the JASMAX design added steel structures that generate a sense of lightness and transparency.

Below: An artist's impression showing the finished glazing.