

Box Lit. 134 (268) DURBAN

Conversion of the Durban Ocean Terminal

into offices for Portnet

PLANNING NO. 128 JULY 1993

An unconventional corporate environment

The refurbishment of the Ocean Terminal Building in Durban Harbour as office accommodation for Portnet is an example of the benefits to be gained from finding new uses for existing buildings.

Professional Team

Project managers, architects and Quantity surveyors

Protokon Projects, Durban

Structural, electrical and mechanical engineers

ZAI (Natal) Inc

Main Contractor

Giuricich Brothers (Pty) Ltd

The Ocean Terminal was completed in 1960 and epitomised the Brazilia design paradigm which was common to many public buildings in South Africa at that time. The principal space in the complex was a nine-metre high customs hall, the size of a football field, with a concrete roof supported by y-shaped off-the-shutter concrete columns. Restaurants, offices and toilets were accommodated

in buildings at either end of the hall. The terminal building was sited on the roof of a double-storied fruit pre-cooling building. Parking areas and passenger viewing galleries were incorporated in the complex. Access to the ocean liners berthed alongside the building was via telescopic gangways. The demise of mailship operations resulted in the terminal passing into disuse. Maintenance was costly, and the building did not have a viable function.

The Portnet Brief

The restructuring of the South African Railways and Harbours involved the creation of Portnet as a separate business unit of Transnet. As a result, the Durban Port Manager was presented with a need for rationalisation and consolidation of the Portnet staff "...within an appropriate corporate setting". Protokon were briefed to investigate the feasibility of converting the ocean terminal into an office complex. The architects' brief included the provision of 5 500 square metres of

fully serviced, flexible office space which would house a staff of 300 people in a range of cellular and open-plan offices. The deep space afforded by the customs hall complicated the task of providing individual workstations, each with a degree of privacy, without creating a "...claustrophobic warren". In addition, a modernist building which was both a local landmark and of historical interest, was to be converted to a new use without detracting from the particular qualities of the original architecture. The brief also called for the provision of a large space, at a relatively low capital cost, capable of accommodating the various customs and embarkation functions associated with those liners using Durban as a port of call.

Design resolution

A new entrance was added to what had previously been the arrivals hall. It is distinguished by a suspended canopy and timber steps. The existing mosaic wall murals, which are a distinctive

feature of the interior, were cleaned, and a new entrance counter was provided. The original north restaurant wing, adjacent to this entrance, is in the process of being developed as a conference facility, visitors' centre, port history display area and staff recreation amenity. The entrance foyer leads into a double-volume internal street which serves as the main access route within the building. Three overhead bridges span this space and are connected to it by means of staircases which also provide access to a lower level service zone (previously a baggage tunnel). The western edge of the street has been afforded a distinctive curve: a device which ensures a range of vistas to the periphery from the centre of the complex and also acts as a visual orientation feature for visitors. A clear hierarchy of circulation routes was essential to the design of the office areas. Priority was given to natural light penetration of internal spaces and the maximisation of views and vistas to the outside. The design solution involved inserting two mezzanine floors, with a total area of 2000 square metres, on either side of the central row of columns in the customs hall. These floors were set back from the perimeter walls in order to facilitate daylight penetration and provide views to the outside from workstations. A secondary circulation system in a figure-of-eight pattern, on both levels, resulted in the required subdivision of these office floors in accordance with a predetermined ratio of open-plan to cellular office space.

Construction of the mezzanine floors

A lightweight structural solution to the insertion of the mezzanine floors was a prerequisite in view of the need to keep loads imposed on the existing foundations to a minimum. A powerfloated 100 millimetre thick concrete slab acts in concert with steel beams. Additional steel columns have been inserted on the existing structural column grid: steel I-beams span some ten metres between these columns and the central row of concrete columns. Where structurally permissible, cut-outs were made in the webs of exposed I-beams in order to lighten the appearance of the structure. The visual variety of this structural ensemble complements the ship-like appearance of the interior as a whole. The installation of suspended ceilings below the mezzanine floors has meant that a deep plenum space is provided for various services. The structure is neatly finished off with a fascia of natural anodised aluminium. Bridges, stairs and handrails. The mezzanine floors are linked at either end by means of bridges

constructed in a combination of timber and steel. Their apparently crude aesthetic belies the sophisticated detailing which has been employed, and is a further, literal, reference to the ship-aesthetic which predominates in the interiors of the building. Handrails, decking and stair treads were formed from teak and other hardwoods which were salvaged from customs counters and baggage racks. Balustrades in public areas are distinguished by stainless steel cables and turnbuckles in contrast to those in working areas, which have been fitted with infill panels of obscure safety glass framed in aluminium. The approach adopted to materials placed a high priority on maintaining their integrity and has ensured that the new work is legible as discrete, yet clearly related to the off-the-shutter concrete, aluminium and glass of the existing customs hall.

Ceilings and partitioning

Varying ceiling conditions in the double volume spaces and beneath the existing sloping roof have given rise to innovative applications. Suspended ceilings, supported by a secondary steel structure, are provided in those offices on the upper level which require full enclosure: where ceilings are not required, lighting has been fitted to a system of trunking which is fixed in turn to exposed, painted steel beams. Extensive use has been made of glazing in partitions in order to maintain a sense of transparency. Partitions along the north-south axis are transparent, while those on the east-west axis are solid. The west wall of the central street was

formed by means of a faceted shopfront on a 75 metre radius and an existing shopfront, considered to be a fine example of its period, was refurbished and installed in a modified form between concrete y-columns along the eastern wall of the central street. Floor finishes. The existing terrazzo tiles in the public areas and central street have been restored. Panels of ceramic tiles were used for remedial work as a result of the difficulties encountered in matching the terrazzo finish. Carpet tiles and broadloom carpets have been fitted to the offices. Air conditioning and electrical installations. The excessive heat-loads encountered in the customs hall have been addressed by means of the following:

- An insulated ceiling was fitted below the thin concrete- shell roof;
- Solar film has been applied to all glazed areas and an aluminium sunscreen on the west facade has been refurbished;
- A central chilled water air-conditioning system, combined with ice bank thermal storage, has been installed. Circular ducts have been exposed overhead - to good aesthetic effect. A secondary system of air-handling units with flexible ducting to ceiling outlets provides the requisite cooling for the enclosed offices beneath the mezzanine floors. Console units have been employed in upper-level executive offices and boardrooms. Three-tier power skirting has been used for the reticulation of electrical, telephone and computer networks wherever practicable. Standard low brightness fluorescent fittings have been widely



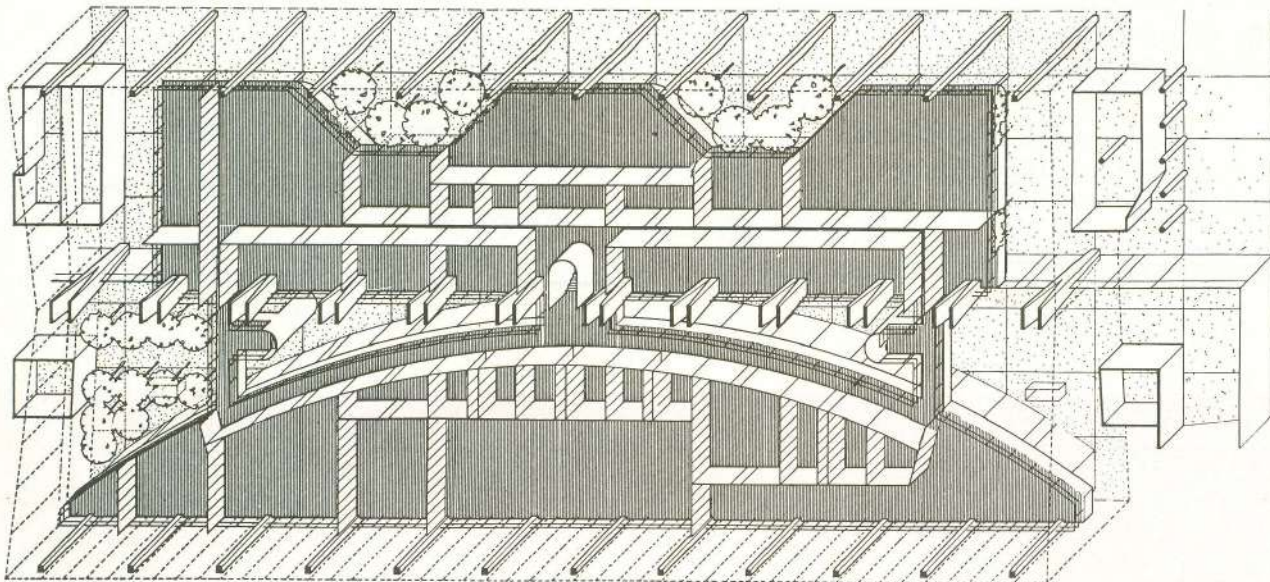
Above. The apparently crude aesthetic of staircases and bridges belies the sophisticated detailing which has been employed, and is a further, literal, reference to the ship-aesthetic which predominates in the interiors of the building

used, with accent lighting in circulation and reception areas being provided by means of tubelights. The existing pendant fittings, with characteristically large bowls, were refurbished and installed in clusters above the central street.

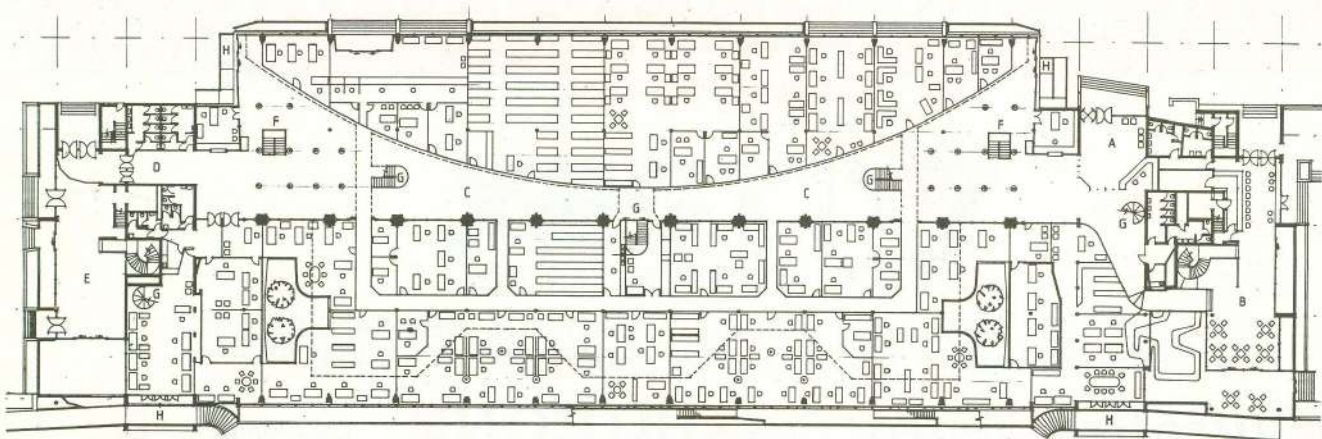
An effective interplay of elements

The architectural impact of this scheme, and its success as a liveable working environment, can be attributed to the effective interplay of the refurbished elements of the original scheme (flamboyant and magnificent in their own right) and the practical components which make up the new work which has been done. While the architects have been criticised for underutilisation of the volume of space available in the customs hall, it is this very spatial

generosity which makes for a uniquely habitable working environment. Cramping every available cubic metre with workstations may appear to be effective space utilisation - in reality it would have led to an environmental paucity characteristic of a mean, ungenerous spirit. A novel spatial experience, with a variety of internal and external vistas, heightened by an awareness of the almost surreal setting of a working harbour, is afforded by the various spaces which make up the new complex. Perhaps most significantly for Portnet employees, this development is considerably better than the "...unremarkable offices in various buildings in Durban's CBD" which they had occupied previously. □



AXONOMETRIC VIEW



- A Main entrance
- B. Conference centre
- C. Internal Street
- D. Staff entrance
- E. Restaurant
- F. Stairs to lower lever
- G. Stairs to upper lever
- H. Exit/ramp
- K. Viewing gallery

ENTRANCE LEVEL PLAN

Ocean Terminal Durban

Office for Portnet



Professional Team:

Client Portnet, Port Engineer, Durban
Project Managers, Architects & Quantity Surveyors:
Protekon Projects, Durban
Structural, Electrical & Mechanical Engineers: ZAI
Main Contractor: Giuricich Bros
Exterior & Toilet Refurbishment Contracts: Gordon
Verhoef & Krause

Introduction

Portnet's new offices in the Ocean Terminal Building create a unique corporate environment. From an elevated position in the centre of Durban Bay, its occupants have an unequalled view of a real working port. Luxurious ocean liners dock at arm's reach; Panamanian cargo ships arrive laden with maize, and leave a week later, visibly lighter. A single ninety-by-twelve metre window frames this panorama, and provides a surreal backdrop to the various offices.

Completed in 1960, at the peak of the mailship era, this magnificent Brazilia-style complex provided a customs hall the size of a football field, with a soaring concrete roof balanced above a central row of nine metre high off-shutter concrete Y-Columns. Buildings at either end of the hall contained restaurants, toilets and offices, and a twelve storey office tower stood alongside. This entire complex was sited on the roof of a two storey fruit pre-cooling shed, with parking areas and passenger viewing galleries, and telescopic gangways connecting to the liners berthed alongside.

With the demise of the mailships, the complex passed into virtual disuse. Maintenance was costly, and without an apparent use, the Ocean Terminal was a sad reminder of a lost era.

The commercialisation of Transnet, and the creation of Portnet as a separate business unit, provided the stimulus for change.

Anxious to rationalise and consolidate his staff in an appropriate corporate setting, the Port Manager appointed Protekon to investigate the feasibility of converting the terminal into an office complex.

The architects were confronted with a number of challenges.

5500 square metres of fully serviced, flexible office space was required to house a staff of 300 people in various cellular and landscaped offices. To provide this within the deep plan of the hall, and give individual workstations the desired degree of privacy without creating a claustrophobic warren, was particularly taxing.

A clear hierarchy of circulation routes was critical, coupled with the need to allow natural light to penetrate deep into the central spaces, and a desire to give every office a view to the exterior.



Above: Bridge linking mezzanines over street. Re-used teak planking and handrails.

Facing page top: Exterior view of terminal.

Facing page bottom: Aerial view of the terminal showing the 'tentlike marquee' on the adjacent roof deck.

The task of fundamentally altering one of Durban's most magnificent modern buildings, without detracting from this magnificence, was daunting.

The brief further required an interim alternative passenger facility.

This was to provide a large space at a low capital cost, capable of accommodating the various customs and embarkation functions of the liners using Durban as a port of call.

In consultation with the relevant authorities, a marquee was designed and manufactured, and erected on the adjacent roofdeck.

A tension structure was chosen for its ability to withstand high winds, and its relative freedom from guy ropes and poles.

Design Solution

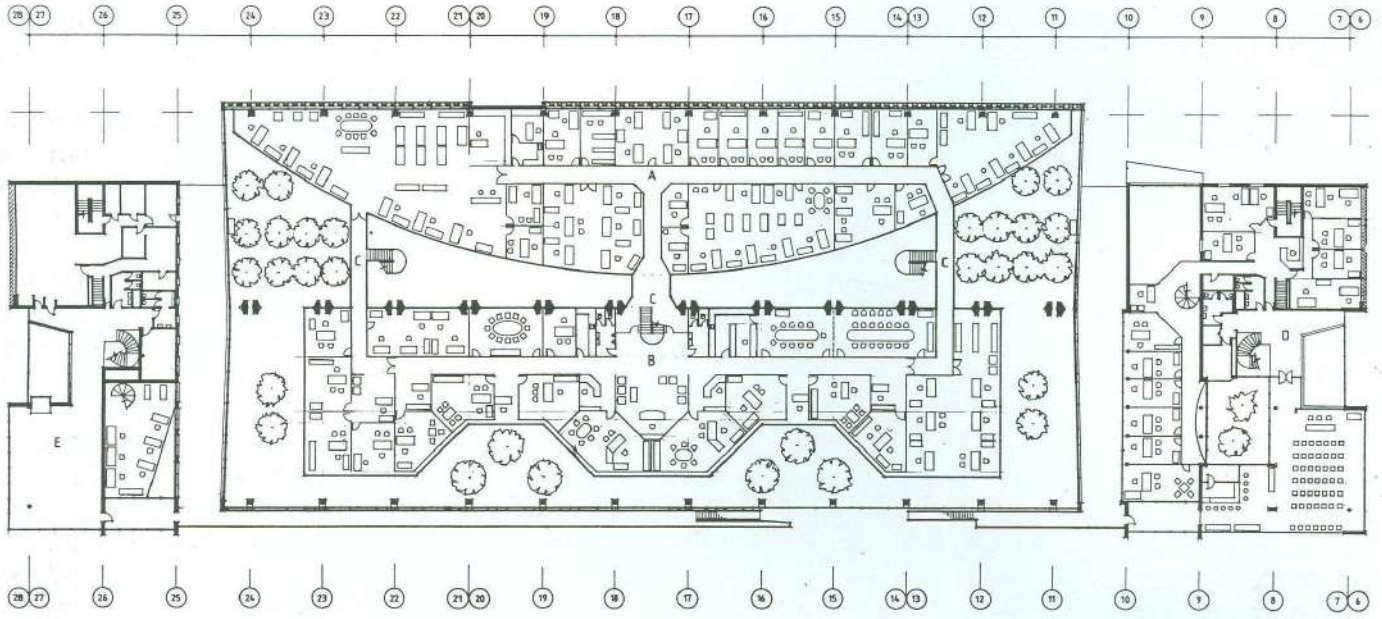
A new entrance was built with suspended canopy and timber steps, into

what was previously the arrivals foyer. The extensive mosaic murals decorating the walls were cleaned up, and an entrance counter provided.

A conference facility, visitors centre, display of Port history and current events, and staff recreation area are being developed in the north restaurant wing, adjacent to the new entrance.

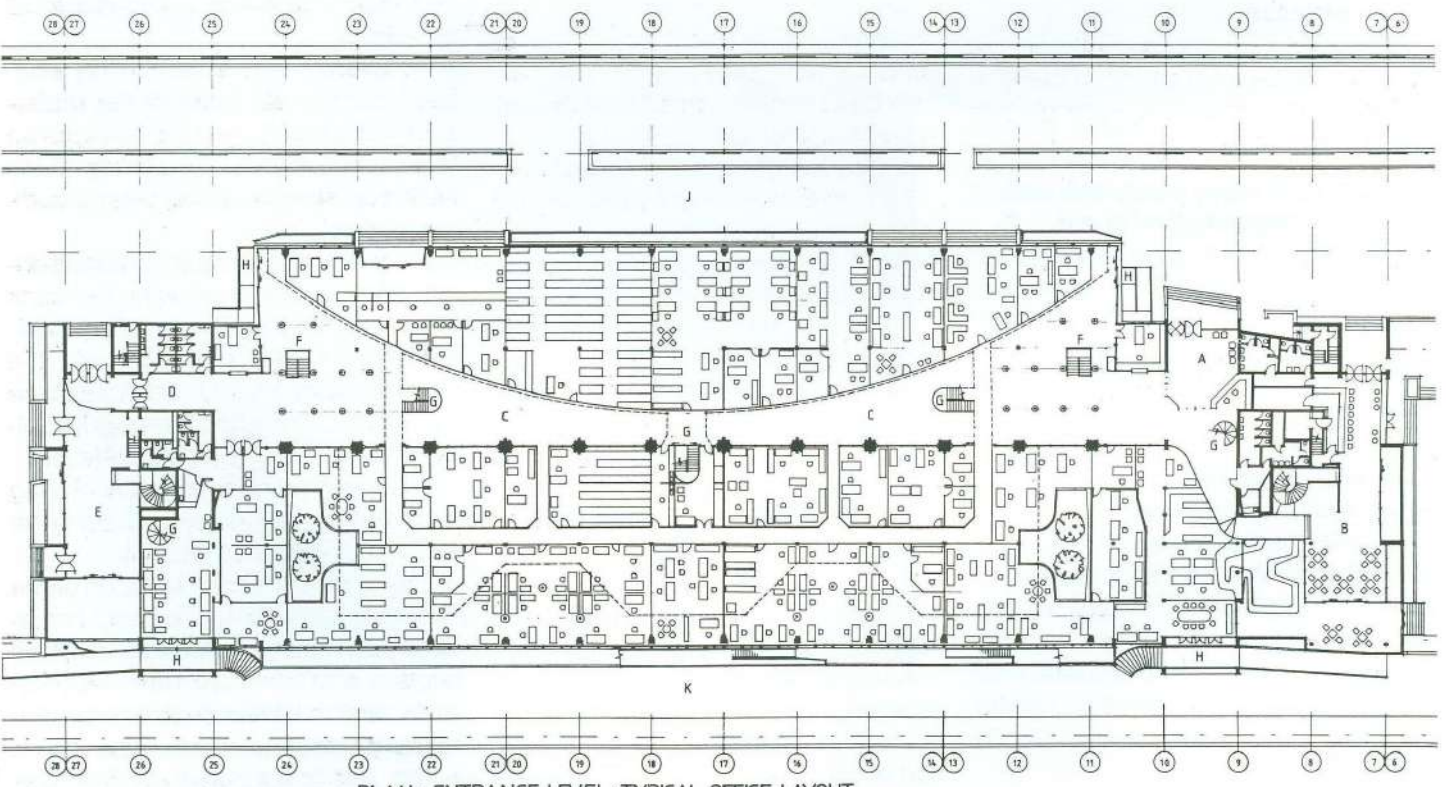
The entrance foyer also leads into a double volume central street. This forms the main circulation route, giving sign-posted access to all offices. It is spanned by three overhead bridges. Stairs from the street lead up to the bridges, and down to a lower level services area in what was previously the baggage tunnel.

The distinctive curve of the west edge of the street was designed to allow views to both sides from the very centre of the complex. This has proved to be a valuable orientating device for staff and visitors.



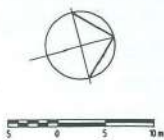
PLAN : UPPER LEVEL : TYPICAL OFFICE LAYOUT

- A WEST MEZZANINE
- B EAST MEZZANINE
- C BRIDGE WITH STAIR DOWN
- D CONFERENCE CENTRE
- E RESTAURANT



PLAN : ENTRANCE LEVEL : TYPICAL OFFICE LAYOUT

- | | |
|-------------------------|-------------------|
| A MAIN ENTRANCE | H EXIT / RAMP |
| B CONFERENCE CENTRE | J PARKING DECK |
| C INTERNAL STREET | K VIEWING GALLERY |
| D STAFF ENTRANCE | |
| E RESTAURANT | |
| F STAIRS TO LOWER LEVEL | |
| G STAIRS TO UPPER LEVEL | |



Two mezzanine floors, with a total area of 2000 square metres, were added, one on either side of the row of central columns. The mezzanines were set back from the perimeter walls, forming double volume edge spaces, giving deep daylight penetration and views out across the bay.

The resulting layout provided the required floor areas, and allowed for a range of office types and orientations.

A secondary circulation system in a figure-of-8 pattern on both levels further subdivided the office floors and created the required ratio of cellular to open offices.

Mezzanine Construction

In order to minimise the load imposed on the existing foundations, a light-weight structural solution was required for the mezzanine floors. A power-floated 100 mm concrete slab, acting compositely with steel beams, was used. The main steel I-beams, at 7.5 metre centres, spanned 10 metres from the central concrete columns to additional steel columns bearing on the existing structural column grid.

Where structurally permissible, cut-outs were made in the web of exposed I-beams, to decrease the visual weight of the structure.

A suspended ceiling with drop-in acoustic tiles was fixed below the mezzanine slab, creating a deep plenum space to accommodate the various services. A fascia of natural anodised aluminium panels, to various profiles, was used to complete the mezzanine structure.

Bridges, Stairs and Handrails

Two timber and steel bridges link the mezzanines at each end. A deliberately crude, yet carefully detailed aesthetic was chosen, both to reduce costs and to make reference to modern ship detailing.

Teak and other hardwoods salvaged from the many customs counters and baggage racks was re-used as hand-railing, decking and stair treads.

Ballustrades to public areas were fitted with stainless steel cables and turnbuckles; those to workspaces received infill panels of obscure safety glass in aluminium framing.

Wherever possible, materials were used to display their inherent or natural finishes. This technique ensured that

the new work was seen as discreet yet interdependent with the off-shutter concrete and aluminium and glass finishes of the existing Customs Hall.

Ceilings and Partitioning

Due to the varying ceiling conditions in the double volume spaces and beneath the existing sloping roof, certain novel ceiling applications were called for.

Those offices on the upper level that required total enclosure were fitted with suspended ceilings. In order to reduce the number of ceiling hangers, a secondary grid of painted steel beams was hung from the concrete roof, and the ceilings suspended from these.

Where ceilings were not required on the upper level, lighting was fitted to a system of trunking, again fixed to painted steel beams.

Pelican demountable partitions were used throughout, either to doorhead height or floor-to-ceiling.

A variety of vinyl finishes were used to distinguish between different space usages.

Extensive use was made of glazing in internal partitions, to ensure a visual transparency. A general design principle was that partitions in the north-south axis would be transparent, and those in the east-west axis would be opaque. User privacy was controlled with the use of obscure film and vertical/venetian blinds.

Executive offices were fitted with fully glazed shopfronts overlooking the views; the west wall to the central street was formed by a faceted shopfront on a 75 metre radius.

For the eastern wall to the central street, a particularly fine existing period shopfront was removed, refurbished, and replaced in a modified form between the concrete Y-columns.

Floor Finishes

In the public areas and central street, the existing terrazzo tiles were retained, after extensive grinding and re-sealing. Due to the difficulty of matching this finish, panels of ceramic tiles were used for all remedial work.

Offices and passages were fitted with carpet tiles – grey and charcoal being used in various combinations and patterns. Executive offices received bordered broadloom carpets.

Furniture

Existing furniture was used extensively in the offices. The interior design thus had to be robust enough to cope with furniture of different styles and finishes.

Portnet is fortunate to have a significant collection of historical furniture of a nautical flavour, and this has been imaginatively displayed in executive and reception areas.

Additionally, new conference tables and the main reception counter were made by Portnet staff to the Architect's design, using oak and teak obtained during the demolitions.

It is intended that the extensive public areas within the complex be used to display items of historic interest. Display screens have been provided.

A number of artworks adorned the Terminal – these are being restored and re-incorporated as decor. These include a large South African coat of arms (mounted on the front facade) to welcome visitors; mosaic murals; and abstract and realist sculptures.

Air-conditioning

Although naturally ventilated, the Customs Hall had extreme heat-load problems due to the thin concrete shell roof and extensive areas of glazing to all elevations.

To overcome the former, an insulated ceiling was fitted to the underside of the roof. Solar film was applied to all windows, and an existing aluminium sun screen on the west facade refurbished.

A central chilled water air-conditioning system combined with ice bank thermal storage facilities, was installed.

Technical difficulties forced the abandonment of a proposal to use the sea for heat dissipation. Instead, cooling towers were fitted at wharf level.

The main plant room, with chilling plant and ice tanks, was located in the shed below the customs hall.

Fan-coil units were placed on either end of the baggage tunnel, immediately below the hall. From these, twin ducts rise to spreader ducts at each end of the hall. Twelve exposed circular ducts are suspended overhead, with regularly spaced supply air outlets.