



# Bridge City



1 Computer image of Bridge City

## INTRODUCTION

Developed by Effingham Development JV, a joint venture between Tongaat Hulett Developments and Ethekwini Municipality, and project-managed by Tongaat Hulett Developments, Bridge City will serve as a new town centre

for Inanda, Ntuzuma, KwaMashu and Phoenix, and will include a subterranean Metro-rail station (capacity – 100 000 commuters a day) with associated inter-modal transfer facilities (buses and taxis), a 42 000 m<sup>2</sup> shopping centre, a regional magistrate's court and a regional 450-bed hospital. Complementing this will be an additional 600 000 m<sup>2</sup> of

Viewed as a catalyst for social and economic growth in the region, and a model to demonstrate successful development of previously disadvantaged communities, the Bridge City project outside Durban is a unique development in the South African and African context. Holistic planning ensures that Bridge City's key residential, commercial and retail developments will be served by an inter-modal transport hub, including a railway station underneath the town's shopping centre, thereby minimising the need for vehicle transport, and creating significant cost efficiencies

commercial, retail and residential opportunities (potentially up to 4 500 residential apartments), all in a quality setting and with quality finishes.

Bridge City is expected to create sustainable business growth and employment, in addition to providing a sound infrastructure that supports the development of small and large businesses. By

facilitating broader economic participation, Bridge City is in fact ensuring its own sustainability and viability to members of the surrounding communities.

Phase 1 of the project made provision for construction of the bulk earthworks and primary internal road network, together with the main service connections. This included the bulk excavation for the subterranean railway station.

Phase 2 provided for the construction of the three main road links to the site, as well as other internal roads giving access to the new Bridge City Shopping Centre.

The R90 million Phases 1 and 2 were completed in time for the opening on 29 October 2009 of the 42 000 m<sup>2</sup> Bridge City Shopping Centre – the first commercial development on the site.

### PROJECT DESCRIPTION

The project is in essence a “green field” development, although a portion of the site was terraced and serviced some 25 years ago. None of the previous infrastructure, however, was re-usable in the new town planning layout which, amongst other elements, required major bulk earthworks to re-shape the site to its present form.

The major engineering challenge was the re-modelling of the industrial

earthworks platform to economically re-shape it to suit the moderate slopes required for a CBD development, and the “dig-out” requirement of the subterranean railway station – all the while working within the constraints of the following pre-determined transport links:

- The planned railway line from Durban
- The new Bhejane Road linkage into residential KwaMashu
- The Besters intersection
- A proposed half-diamond interchange onto the M25 freeway with access to the Phoenix industrial area
- A link to the lower platform.

The most intricate element proved to be the design of the interface between Bhejane Road, the future railway line and intermodal access road, while also retaining access for the adjacent Vezi Road community.

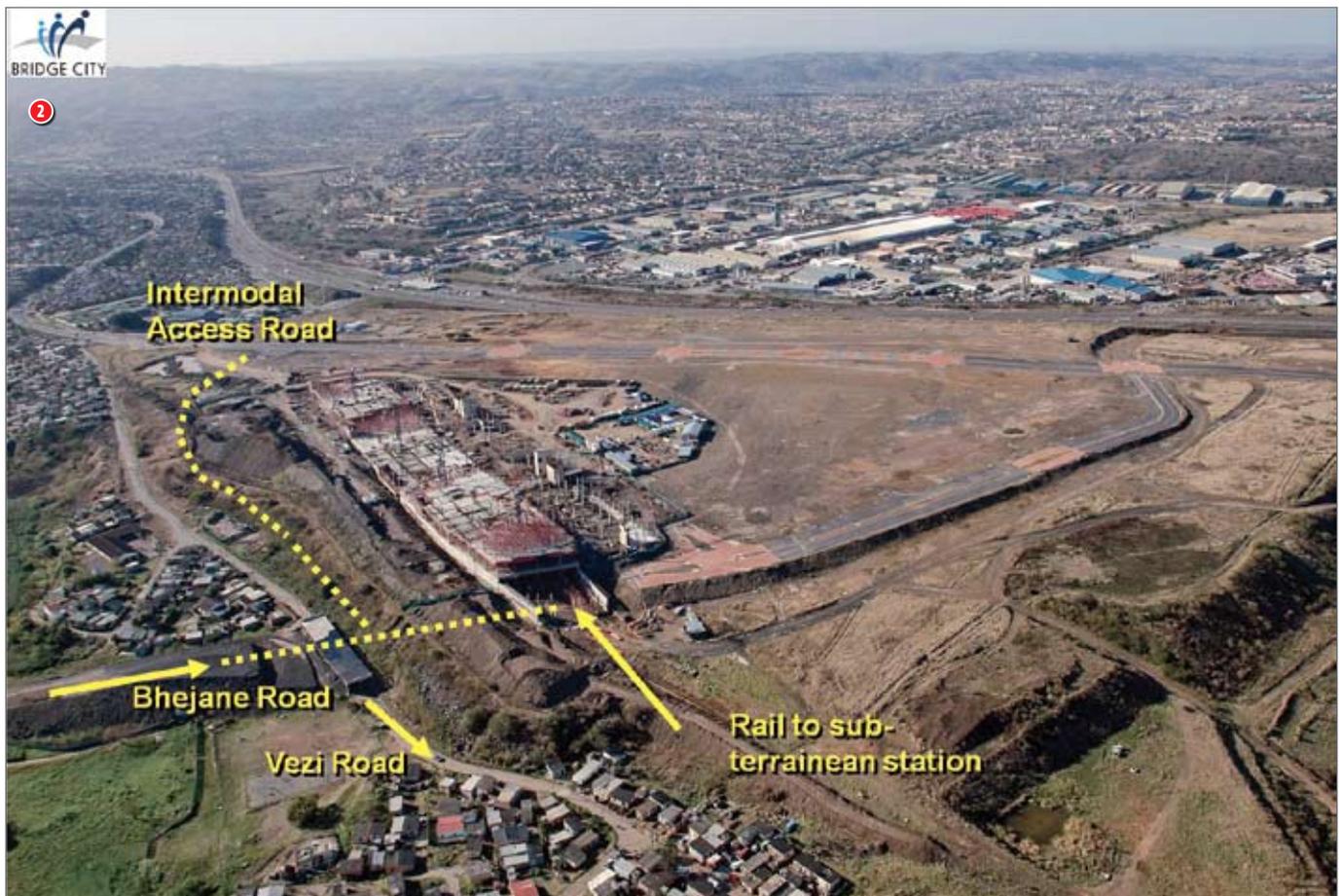
This was achieved through the design and construction of a road-over-rail bridge, and the construction of a 14 m high retaining wall to provide the necessary platform area for the intermodal access road and the Bhejane Road link to the development. Vezi Road was kept open for the community via an underpass provided by the municipality.

A road-over-rail bridge was constructed on Bhejane Road as a separate

2 View of the Bridge City Shopping Centre and surrounding infrastructure, as well as the major intersection illustrating the need for a retaining wall

3 Major transport linkages to Bridge City node

4 Completed Green Terramesh retaining wall at major intersection



contract which coincided with the end of the Phase 1 and the beginning of the Phase 2 contracts. This bridge provides grade separation between the future rail tracks to the subterranean station and Bhejane Road, the primary road link with KwaMashu.

Several options were evaluated for the 14 m high retaining wall before a final decision was made. The mass gravity Green Terramesh retaining system was selected as it offered several advantages over other alternatives, namely:

- Constructability without the need for specialist skills or equipment
- Environmentally and aesthetically pleasing vegetated face on completion
- Speed of construction and cost savings.

In order to maximise the developable area, the road reserve widths were kept to a minimum. This, combined with the wide boulevard type roadways, resulted in severe congestion in accommodating the numerous services in the road verges. To alleviate the problem, it was decided to deviate from standard practice and to slope the dual carriageway roads towards the central median islands and to locate the main storm water drainage system along the road centre-line. This freed up valuable space for other utilities, while eliminating the need for a duplicated pipe system on both sides of the roadways. Apart from freeing up valuable space, significant cost savings were also achieved.

### CONSTRUCTION PROGRAMME AND BUDGETS

The Phase 1 contract was awarded in November 2006 and was due for completion in June 2007. The completion date was revised due to increases in the scope of work, and Phase 1 was finally completed in April 2008. Although completed after the originally scheduled date, this did not have any significant impact on the development.

With the sale of the shopping centre site to a private developer, it was incumbent on the Effingham Development JV to provide the necessary roads and infrastructure to coincide with the opening of the centre in October 2009.

The road-over-rail bridge contract was awarded in July 2008 with completion scheduled for April 2009. The contract was completed in January 2009 almost three months early and well within budget.

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The Phase 2 contract, awarded in October 2008, was scheduled for completion in August 2009. Significant elements of this contract were directly adjacent to the shopping centre, resulting in the Phase 2 contractor only having restricted access for long periods to allow the shopping centre contractor access during their very tight schedule to meet the opening deadline date.

Ongoing project facilitation in the interests of the holistic development lead to the Phase 2 contract being re-programmed, with the completion date being postponed. In order to achieve the milestone of the shopping centre opening, the Phase 2 contractor increased his resources and working hours significantly and ensured that all necessary services were completed on time. Despite the extended construction period, the project was completed within budget.

#### ENVIRONMENTAL CONSIDERATIONS

No perennial or seasonal streams traverse the development site, and previous earthworks operations meant that there was nothing of ecological or cultural significance that needed to be protected.

However, the site is bordered by the Phoenix industrial area to the north and by two pockets of formal residential development to the south. In cognisance of these communities, dust control measures were introduced and carefully monitored during bulk earthworks operations and cement stabilising of the layerworks.

A very detailed approved environmental management plan was specified by Tongaat Hulett Developments, and construction was continuously monitored for compliance.

#### COMMUNITY BENEFITS AND OPPORTUNITIES

Development of Bridge City has resulted in several short- and long-term benefits for the surrounding communities.

During the various contracts, it was mandatory for contractors to source as many of their staff as possible from the local communities. In addition, the subcontracting of selected elements of the work was encouraged, with particular emphasis placed on the transfer of skills to emerging contractors. Formal structured training of selected individuals took place, with participants receiving documented proof of the course content and level of proficiency. Many of the



staff employed by tenants of the shopping centre were also recruited locally.

Apart from the employment benefits, the long-term social benefits will include, amongst others, the provision of a modal transfer facility for bus, train and taxi commuters. Not only will this provide a convenient and safe terminus to transfer from one mode of transport to another, but being located alongside the shopping centre, it provides easy access to amenities such as banks, food outlets, supermarkets, pharmacies and other line shops and service providers.

Other community facilities already under construction are a Magistrate's Court and Provincial Hospital.

Future planning makes provision for residential as well as commercial development. It is envisaged that the provision of social services such as a new police station, offices of the Department of Home Affairs and other government and municipal departments will soon be established. This will eliminate the need for long trips into Durban or other major centres for everyday requirements such as passports,

identification documents, municipal rates queries and account payments.

## CONCLUSION

Innovative and cost-effective engineering solutions to satisfy the requirements of the road and rail alignments, all in a congested area adjacent to an existing community, have contributed to Bridge City becoming the "new destination" for the Inanda, Ntuzuma, KwaMashu and Phoenix communities, thereby being posed to make a vital contribution to their economic development. □

### PROJECT TEAM

#### Client

Effingham Development JV  
(Tongaat Hulett Developments/  
Ethekewini Municipality)

#### Consulting Engineers

Stemele Bosch Africa (Pty) Ltd

#### Contractors

Phase 1 – GLTA Earthworks  
Phase 2 – Fountain Civil Engineering  
Road-over-rail bridge – Afrostructures  
Specialist design input for retaining wall  
– GAP Consulting

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- 5 Road-over-rail bridge (lower left) being constructed adjacent to shopping centre
- 6 Construction of shopping centre and surrounding infrastructure. Note restricted work space
- 7 Aerial view of new intersection constructed on retained fill

### Source:

[http://www.saice.org.za/downloads/monthly\\_publications/2010/2010-Civil-Engineering-oct/#/0](http://www.saice.org.za/downloads/monthly_publications/2010/2010-Civil-Engineering-oct/#/0)