'Precedents provide insight as to the functional requirements of a border post, building on a sloping site, and a study of approach- ROAD ARCHITECTURE'

PRECEDENT STUDIES 4

approach Multi level

Toll system

International connectivity

One- stop

4.1 CALEXICO

4_001

location Calexico; USA and Mexico
function Border Crossing
architect Dworsky Associates


4_002


4_003


4_004


4_005

Calexico is located 120 miles east of San Diego. High security checks are necessary due to the large socio– economic differences between the USA and Mexico; drug, pornography and other smuggling; and the September 11 attacks. Security checking should however be balanced as to not strangle local and regional economies and local cross–border movements.

Border posts themselves form an integral part of local economies and trans–border infrastructure, there is a continuous improvement of cooperation in border control procedures between the United States and Mexico. Corruption is reduced by contracting out ' secondary inspections'. The border also has dedicated commuter lanes with electronic inspection technology. A website operates, which is updated every 30 minutes, indicating the number of open lanes at each of the 2 border crossings, and the expected waiting time at each provides information to prospective users of the facilities.

Long delays occur at visas/ passport and commercial vehicle check points during daily peak periods. This is due to limited crossing hours, and the lack of infrastructure and staff.

Two modest concrete block office buildings are tied together with a glazed lobby filled with light from a Teflon coated, glass fibre canopy. The north/ south oriented lobby offers views to both the countries.

4.2 Rainbow Bridge

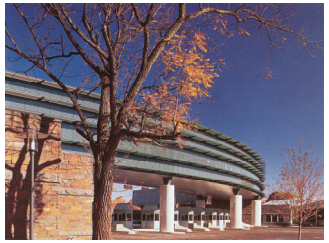
American borders can be studied to aid in the design of a new South African border for a number of reasons. Although traffic between America and her neighboring countries is vastly greater than between South Africa and Mozambique, the principles remain the same.

Crossing the line between the United States and Canada, at Rainbow Bridge, is a mere formality. Entrants summarise their itinerary to a U.S. Customs officer, who waves them on, this simple procedure is nevertheless, very significant.

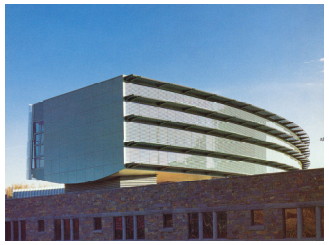
The border station, whose midpoint is the international border, is curved in plan and supported on stone clad columns providing toll and inspection facilities below. Six toll lanes cater for vehicles leaving USA, and 19 inspection lanes allow for optimal efficiency in searching those entering the United States.

The roofs of the outbuildings and parking shelters stand in contrast to the main Customs and Immigration Building. Orientation of the building and roof structure ensues that emphasis is placed on arrival into the USA and not departure there from.

The enormity of the decision to place a border post next to the worlds tallest waterfalls, Niagara Falls, makes this a site of great public interest. The relation between surrounds and building becomes an important consideration to the architect. Natural features need to take preference, and in light of this the magnitude of scale of this building is questionable. It is this idea versus that of delivering a 'boundary', or place symbolic of authority, pride and control which come up against each other.



4_006



4_007

4_008

4_009

4_010

location Niagara Falls; USA and Canada
function Border Crossing
architect Hardy Holzman Pfeiffer Associates

Arcidi, P. 1999

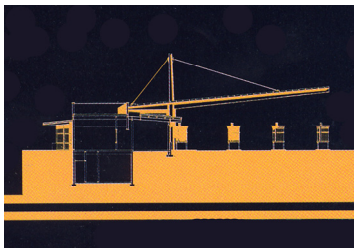
4.3 Point Roberts

4_011

location Point Roberts; USA and Canada
function Border Crossing
architect Miller & Hull

4_012

4_013



4_014

4_015

Point Roberts provides the border between the United States and Canada, at the furthest western crossing on the North American Continent.

Concrete, steel and glass is used for booths and outbuilding to match the construction of the main building. The rain– coast construction provides a dialogue between natural and built tectonics. The design takes into account the natural surrounds, and optimises natural light through the orientation of the roof structure, which extends into nature.

The architecture of roofs and overhangs become the main elements of the architecture and define the main functions, toll and inspection facilities. Scale proves to be of a smaller scale than that of Rainbow Bridge and is more apt to review in relation to the scale of border post as required at Ressano Garcia.

The public interior areas are distinguished by the geometries of steel structure and tubular air ducts. The contrast of material choice differentiates functions and denotes a spirit of openness. The building opens up to views of the wooded grounds and the interior and exterior orientations of the building respond to the ecology of the backdrop.

The linearity of the design on plan becomes an important reference point. It provides the linkage between nature and road. Two situations arise when contemplating a border. Either a linear form, parallel to the road and movement can be explored, or alternatively a building form following the physical border line, whereby movement needs to dissect the building, and the building literally becomes a border.

4.4 BEIT BRIDGE

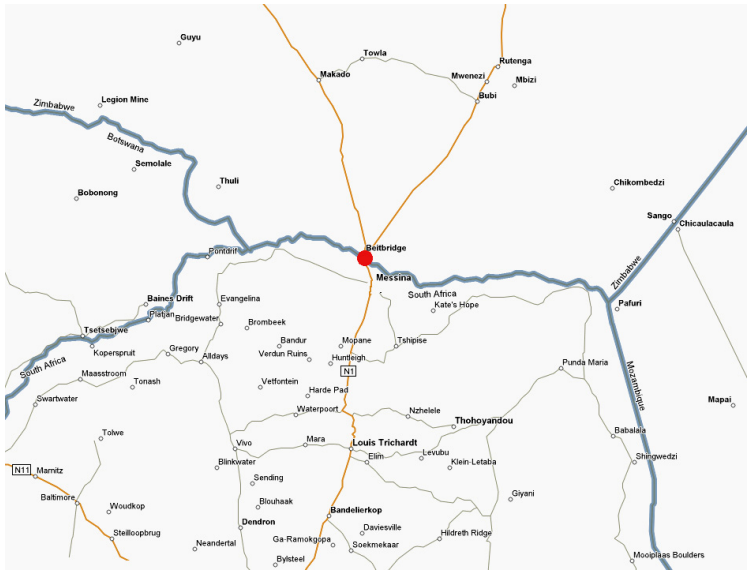
Beit Bridge is 12 km from Messina in the Northern Province. The Bridge spans the river and carries road and rail traffic to and from South Africa. It is the largest of the border posts that South Africa shares with her neighboring countries, and has the most traffic flowing through annually.

Rehabilitation work is always being done at the border. Due to the precarious nature of the current relations, not only between South Africa and Zimbabwe, but between the entire globe and Zimbabwe, trade between Zimbabwe and the rest of the world stands on uncertain footing.

The identified needs, as were expressed by the departments that function from the Beit Bridge border, include:

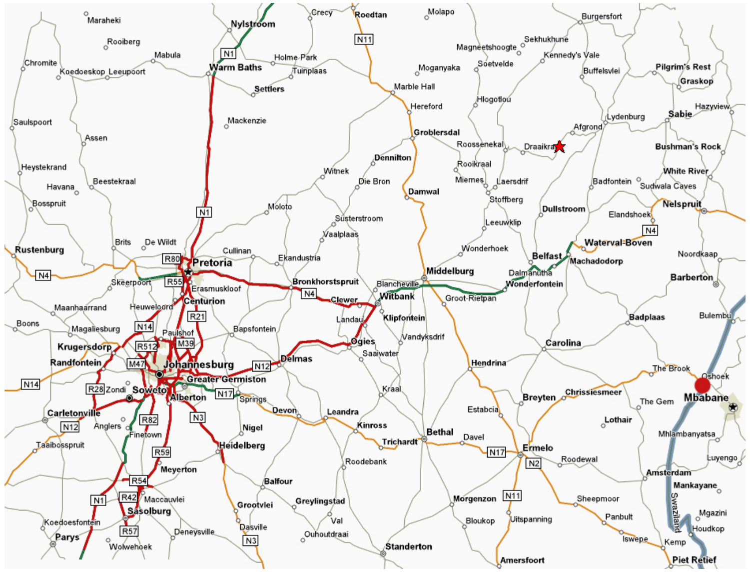
_ conference rooms
_ office space
_ strong rooms
_ store rooms
_ staff kitchen and tea room
_ public ablutions
_ parking bays and carports
_ inadequate residential accommodation

Electricity is supplied by Eskom and water is pumped from the nearby river and stored overhead in water storage tanks. Sewerage is dealt with using septic tanks.



4_016

location Beit Bridge, South Africa & Zimbabwe
function Border Crossing



4_017

location Ngwenya, South Africa & Swaziland
function Border Crossing

4_018


4_019


4_020


4_021

Ngwenya border post, between South Africa and Swaziland, is 90 km from the town of Ermelo.

The user departments include South African Revenue Services, Department of Home Affairs, South African Police Services, and the Department of Agriculture. No booms are in place and canopies are needed over all search bays and platforms.

Major problems are the lack of office space, parking bays and inspection facilities. There is limited passport control office space and only six work stations for a staff composite of 15 people per shift. Electrical supply is by Eskom, power failures are frequent and generator power is a requirement. Water is supplied by two boreholes and there is an onsite sewerage treatment plant.

The identified operational needs which would enhance operational efficiency include:
_ canopies over search bays
_ freight inspection platforms
_ canopy over the platform
_ truck docking bays
_ inspection walkway
_ inspection trench
_ weigh bridge
_ parking bays

Garages are currently used for accommodation for the Customs and Immigration officials, new residential accommodation is one of the key requirements. This needs to be studied on a socio–cultural level as to determine a suitable location for a new housing precinct for the staff and their families.

The border is an island type design, as are all South African borders.

4.6 Constitution Hill

Constitution Hill is the site of the Old Fort Prison complex and now the new Constitutional Court. The precinct comprises of the Old Fort, Number 4 and the Women's Jail which have all been preserved for their heritage value. The Awaiting Trial block and a few buildings that were situated on the western side of Number 4 have been demolished to meet the space requirements for the new Court building.

The Constitutional Court building itself includes an entrance foyer, and court chamber, the justices' chambers, a library on the northern wing and an exhibition area that runs parallel to the Great African Steps.

The court responds well in context with the surrounding buildings and sub-station, creating well shaded internal courtyards. The building relates well with visitors, the slope and lie of the land allows the user to interact with the building on varying levels, and entrances to different sections can be achieved on different levels, also providing the necessary divisions between public and private areas.

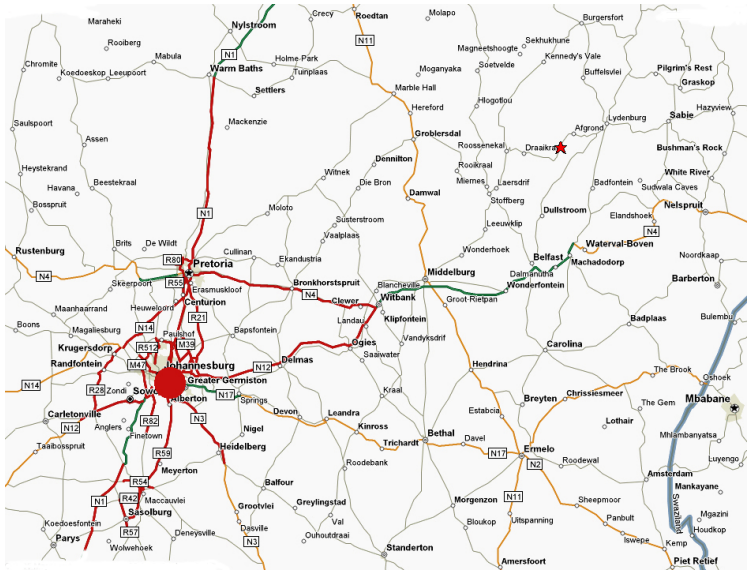
The principle materials are timber, concrete, steel, glass and black slate, all local materials except for the timber which is thought to be imported from Asia. Bricks recovered from the awaiting trial block have been used in the construction of the new walls and the great African steps which divide the old stone wall of number four and the courts glass frontage.

4_022

4_023

4_024

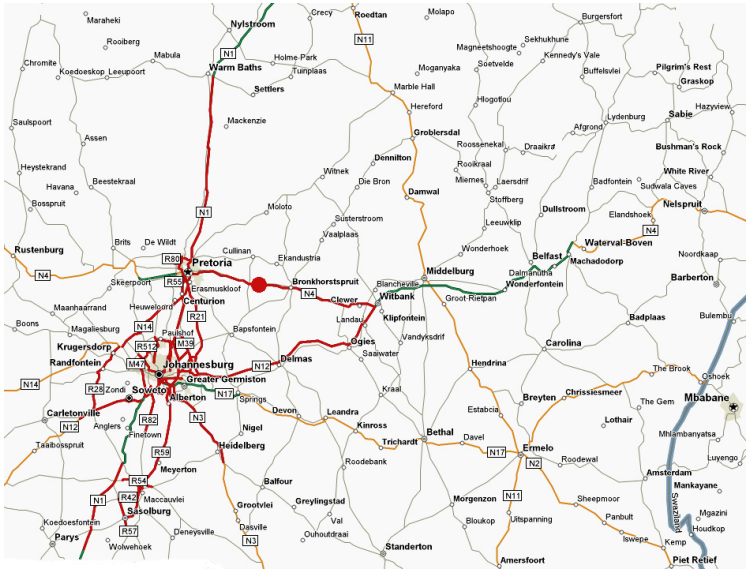
4_025



4_026

location Constitution Hill, Johannesburg, South Africa
function Constitutional court precinct
architect Urban Solutions & OMM Workshop

4.7 DIAMOND HILL



4_027

location	Diamond Hill
function	N4 Toll Gate
architect	Tolplan

4_028

4_029

4_030

4_031

The Diamond hill toll gate is situated on the N4 National Highway between Pretoria and Bronkhortspruit. Construction was completed in 2003. It become the 5th toll gate on the Maputo Corridor between Pretoria and Maputo.

Other Toll gates are situated in Middleburg, Machadodorp, Malelane and in Mozambique.

The design is by Tolplan, who are responsible for most toll facilities in South Africa. It is a small scale building and comprises of three cube structures, linked with common passages and roof overhangs.

The building stands isolated on raised ground, to the south of the road. Tall steel structures frame the precinct and provide lighting after the sun sets. The entrance to the administration building is approximately 300m to the west of the toll gates.

The administration building is constructed from brick, steel and glass. The absence of natural vegetation to provide shading is noticeable, overhangs are not large enough to work efficiently, and the double volume glass frontage forming the northern façade results in sunlight streaming in from mid morning.

Water storage tanks become an integrated part of the design, not only on the Diamond Hill site but all along the N4 in the District municipality area.

Detailing of the water tank support structures is an integral part of the design and proves a successful notion in developing an overall design language along the highway.