Hot Dip Galvanized Case Study No. 23
Rural Pedestrian Bridges

The Application

During the rainy seasons, many rivers are subject to flooding at which times rural areas of the country become isolated and cut off. Many rural communities are often forced to attempt an unsafe river crossing or face a long, time consuming, detour to access service amenities such as trading stores, schools, clinics and hospitals.

Initiatives on the part of various authorities, together with the affected communities, identified the desperate need to construct suitable and safe river crossings. This initiative, over the past three or four years, has seen the construction of various types of pedestrian bridges that are now benefitting the local communities in such affected areas.

This case study is a review of some of these river crossings

Ha Mofutho near Quasha's Nek, Lesotho, Senqu River

Environmental Conditions

In terms of the ISO 9223:2012 specification, environmental conditions in many rural areas conform to a corrosive category of C2 or C3. Refer to the Associations' Information Sheet No.8, "Corrosion of Zinc – Corrosivity of atmospheres". Corrosion rates for zinc in a C2 atmospheric conditions ranges from 0.1 to ≤ 0.7 and for C3 from 0.7 to ≤ 2 µm per year. By choosing to use hot dip galvanizing for corrosion control, the engineers have delivered a maintenance free service life bridge crossing of more than 50 years into the future.

Bisi Pedestrian Bridge Kwazulu Natal
Umzimkhulu

Sites

Many of these bridges are located in remote areas with restricted access and infrastructural support. Bridges are manufactured of steel; fabricated in the main industrial centres, hot dip galvanized and road transported to the rural sites.
Semi and unskilled crews are then used to erect the structure on the prepared foundations. Site activities using this type of structure are generally a lot easier than building the concrete equivalent.

Makanise Bridge known as Pongola Bridge
Kwazulu Natal Richards Bay area

Insuze Bridge - Kwazulu Natal

Sikwebezi Bridge – Kwazulu Natal

Zwelitsha Pedestrian Bridge over the Buffalo River
Eastern Cape
Hot Dip Galvanized and painted

Ntombe River Bridge
Hot Dip Galvanized and painted
Northern Kwazulu Natal – near the site of the
Battle of Ntombe drift 1879

Ncome Museum Pedestrian Spiral Bridge
Kwazulu Natal – the site of the Battle of Blood River
16 December 1838

HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

M1150 Ludeke Dam – Pedestrian Steel Bridge
Eastern Cape

Conclusion

The primary features and benefits achieved on these projects were:

1. Cost and economic effectiveness of hot dip galvanizing, given the site location and non-availability of local materials and equipment.
2. Versatility of hot dip galvanized steel and the proven and effective methods used to combat corrosive elements within the given environment.
3. Alternative corrosion control coatings cannot match the performance of hot dip galvanizing when one considers the rough handling involved in loading, transportation and offloading at such an isolated site.
4. Design requirements of durability and maintenance free longevity have been achieved by way of the metallurgically bonded hot dip galvanized zinc coating, both from the standpoint of a “barrier protection” as well as “cathodic protection”.