



## Pont de l'Enfance – Radical facelift for a bridge in Cameroon: Temporary bridge replaced by permanent structure after 35 years

**Hubert VANDER MEULEN**

Senior Project Manager  
BESIX Engineering  
Department  
BELGIUM  
*hvandermeulen@besix.com*

Hubert Vander Meulen, born 1976, received his industrial engineering degree from the E.C.A.M., Belgium. He works since 2001 for BESIX Engineering Department. His main speciality is related to bridges and jetties.

### Summary

The bridge “Pont de l'Enfance” in Cameroon, originally built between 1977 and 1979, is situated in Koro, between the villages of Sa'a and Ntui, and crossing the Sanaga River there. A two-lane bridge was originally planned. The single-lane bridge crossing the river up to last year was intended as a temporary structure. Over 30 years later, it is still in use.

The Cameroon government has awarded the contract for the refurbishment works turning it into a modern 2 lanes bridge. The refurbishment has begun with a thorough inspection of the foundations (seismic survey), resulting in an injection campaign at the interface with bedrock. The existing superstructure of the bridge has been completely dismantled. On the existing foundations, extensions of piers are then erected, together with abutments capable of bearing a new combined bridge deck. The metal skeleton composed of 34 main bearing girders has been assembled at one bank. The metal structure has been hoisted in one go from to the other bank and was let down onto its final supports. Precast collaborating roadway elements have been installed and connected after launching.

The complexity of the project lies in the fact that the works have to be scheduled according to the water level of the Sanaga River. This is because the piers need to be refurbished and extended in dry conditions. The current bridge deck has been used as a work area, eliminating the need to use waterborne craft to gain access to the site.

**Keywords:** Cameroon; bridge; refurbishment; launching; inspection, seismic survey; collaborative deck; prefabrication

### 1. Context

The bridge “Pont de l'Enfance” in Cameroon, originally built between 1977 and 1979, is situated in Koro, between the villages of Sa'a and Ntui, and crossing the Sanaga River there. A two-lane bridge was originally planned. The single-lane bridge crossing the river up to last year was intended as a temporary structure. Over 30 years later, it was still in use.

The Cameroon government has awarded the contract for the refurbishment works turning it into a modern 2 lanes bridge. The works have consisted in:

- Inspection and dismantling of existing steel superstructure
- Throughout inspection of the foundations, from interface with bedrock to quality of concrete
- Refurbishment of foundations
- Extension of piers and installation of new bearings
- Inspection, refurbishment and extension of abutment
- Launching of prefabricated metal skeleton assembled on the bank
- Connection of precast collaborating roadway by in situ stitches and finishes

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*Fig. 1: Old bridge*



*Fig. 2: New bridge*

## **2. Construction methodology**

Several construction techniques could have been used for the refurbishment project of “Pont de l’Enfance”. It has been established that some parts of the works were not possible during the rainy season, corresponding to a high water level of the river.

In order to ensure that refurbishment works could be planned all year long, independently from the river level and river flow, a cross-discipline assessment looking at methodology, planning and design input has been organised at project award. This exercise has conducted to the selection of the following constructive options:

- dismantling with a cantilever method;
- repair of the foundations from deck level;
- extension of piers during dismantling with access from maintained deck;
- upgrading of the abutment by addition of an extension at intermediate level;
- launching of the bridge steel skeleton;
- prefabrication of the structural collaborating deck on the river bank;
- installation of the precast concrete deck from deck level;
- installation on finishes from deck level.

Complementary, use of state of the art survey technique has been used to focus the refurbishment works to the damaged parts only, allowing use of light equipment, compatible with the proposed methodology.

## **3. Conclusion**

This project demonstrates that incorporation of construction methods at an early stage of the detailed design can lead to a safe and efficient construction process, even in adverse environmental conditions.