



■ Bridges



Reference Details:

Owner Sicuani County Department, Lima Ministry for Transportation and Communication, Huancayo Municipal Administration, Huánuco District Authority, all Peru +++ **Engineers** Ph.D. Ing. Víctor Sanchez Moya, Ing. Pedro Lainez Lozada, Ing. José Yeckle, Ing. Moisés Torres, all Lima, Peru

DSI Unit DSI Group Headquarter Operations, Munich, Germany, in cooperation with SAMAYCA INGENIEROS S.A.C., Lima, Peru

DSI Scope Technical development and detailing as well as installation of hangers and anchorages; supply of DYWIDAG Bar Tendons Ø36, grade St 835/1035, sheathings, dampers, spacers, couplers, anchors and accessories; rental of equipment



Construction of arch bridges in Peru

Sicuani and Cirialo Bridges in Cusco, Alcides Carrión bridge in Huancayo, Calicanto bridge in Huánuco, Peru

In the past five years, the road network in Peru has been significantly extended. Major roads through the Andes Mountains have been completed at a supra-regional level which connect the districts of Cusco, Apurímac, Ayacucho, Junín and Huánuco.

The development of the road network at a local level poses particular challenges. For example, the traffic flow has to be coordinated with major urban arterial roads or partly be rerouted around the cities. And quite often, geographic hurdles must be overcome.

Therefore, similar situations arose for several new roads. Medium-sized, significant rivers were to be crossed. These rivers had fundamentally similar cross sections, were between 50 and 60 meters wide and were located in very exposed locations. The structural solution required that these two and four lane bridges be architecturally appealing without raising the level of the roadway. Based on these parameters, four new steel arch bridges were built in various Peruvian cities in 2003-2005. These bridges are characterized both by their impressively compatible designs and their simple and economic method of construction. The construction period for these bridges ranged from 8 to 10 months each.

In 2002, DSI developed an economic solution for anchoring hangers to the bridge deck for the Bolognesi bridge in Piura, Peru, that was built using similar techniques. This solution was used again. In this method, four DYWIDAG Bar Tendons, which are grouted in individual sheaths, are installed. Each group of four bars includes spacers for preventing wind/rain induced vibrations and individual sets of O-rings at both ends for dampers. The longer hanger bars require a fatigue resistant coupler with the bar ends inside cut at a 45-degree angle and fixed in place with two-component glue.

This efficient bridge construction method is becoming ever more established in Peru. With technical support from DSI Munich, DSI's licensee in Peru, SAMAYCA INGENIEROS S.A.C., develops, installs, stresses and grouts hanger bars coincident with the construction of the bridge deck.

