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“Concrete Structures in the 21st Century”

List of Participants

Congress Venue

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Organized by

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技術部 武末博伸

Construction

Elevation

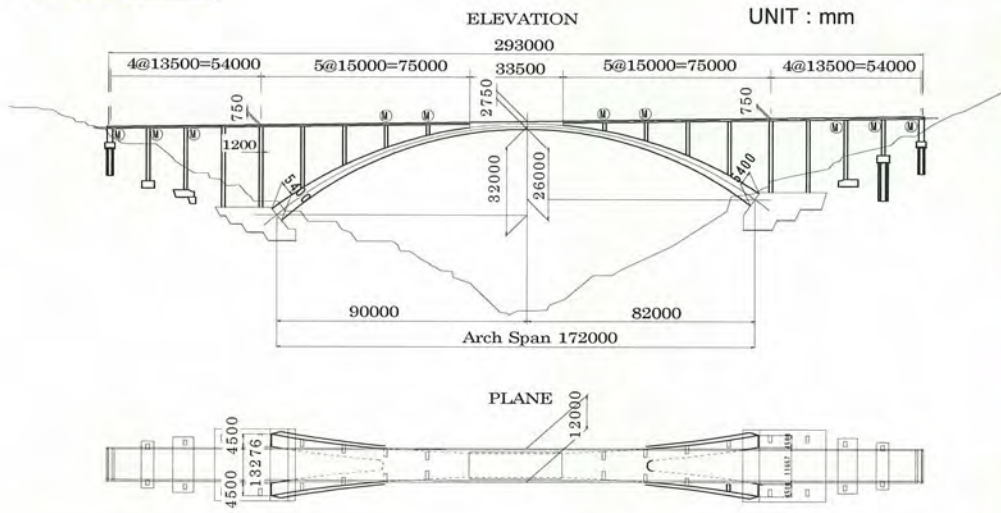


fig.1 Erection of Suspension supports



fig.2 Dismantling of Suspension supports

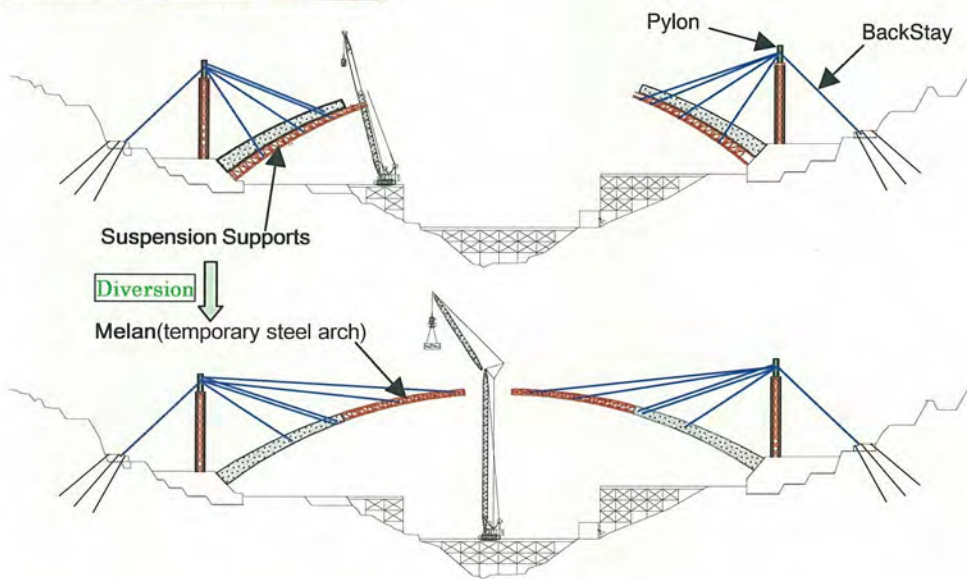


fig.3 Erection of Melan arches



fig.4 Closure of Melan arches (2001.9.14 21:00:03:00)

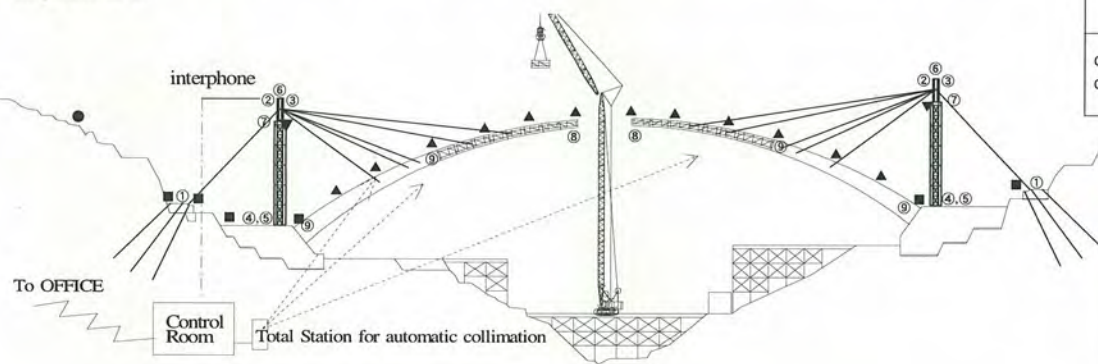
Overview of construction



Computerized construction

All displacement and stress (strain) data items were stored in the PC in the measurement control room set up on the site and transferred via a wireless network to the site office located approximately 100 m away.

When the tension of the stays and backstays was adjusted, the measurement data could be analyzed in real time and instructions given regarding the amount of tension adjustment.



Comparison of Backstay type

FEATURE	Introduced prestress (once time) PC member	Tension adjustment (8 times) PC tendon
	A change of stress on endpost is small	Staging for backstay and Dismantling is unnecessary
Compare COST	① Staging for backstay jacketing ② Backstay concrete jacketing ③ Dismantling and disposal of industrial wastes Sumup ①+②+③ 1.0	④ Tension adjustment of backstay ⑤ Computerized construction (Measurement system) Sumup ④+⑤ 0.3

Measuring instruments

object	item	device	quantity
Erection members	Ground anchor	tension	① 2MN Load cell 4
	Stay	tension	②③ 1MN Load cell 44
	temperature	Thermocouples	
Endpost	deflection	▼ Total station	4
	stress	④⑦ Strain gauges	56
	base anchor	⑤ 500kN Load cell	6
	incline	⑥ Inclinometer	2
Melan arch	stress	⑧ Strain gauges	24
	deflection	▲ Total station	6
	temperature	Thermocouples	
Main members	Arch rib	stress	⑨ Concrete Stress meter 12
	stress	⑨ Reinforcing Bar Stress meter	12
	temperature	Thermocouples	
Foudation and Landslide	displacement	● Total station	9



"Total Station" for automatic collimation

Influence of temperature changes on arch rib camber control

Their behavior can be roughly divided into the pre-closure Melan arches that are free in the lateral direction, and the post-closure Melan arches that are constrained in the lateral direction.

In addition, the different thermal transfer properties of steel and concrete and other factors also result in different behavior during the erection process, when many steel members are used, and in the completed system, which consists only of concrete members.

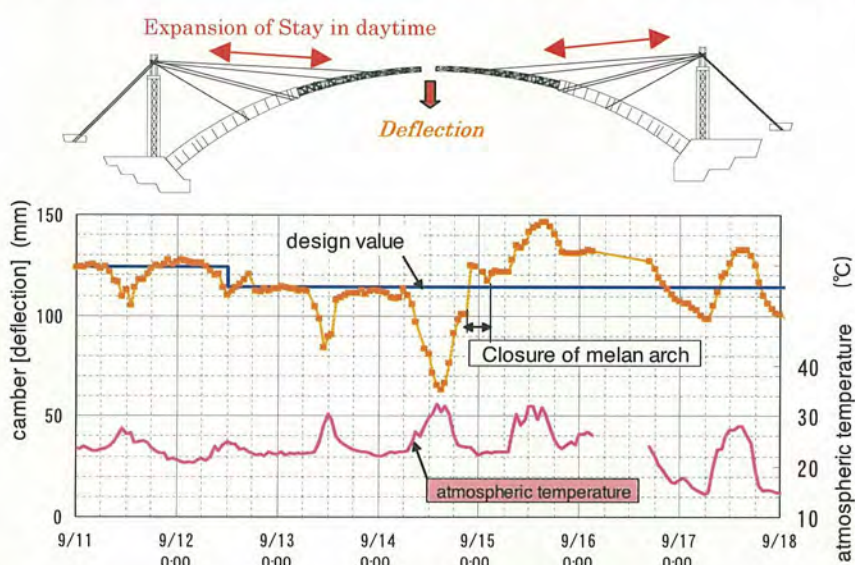


Fig.7 Melan arch deflection before and after closure

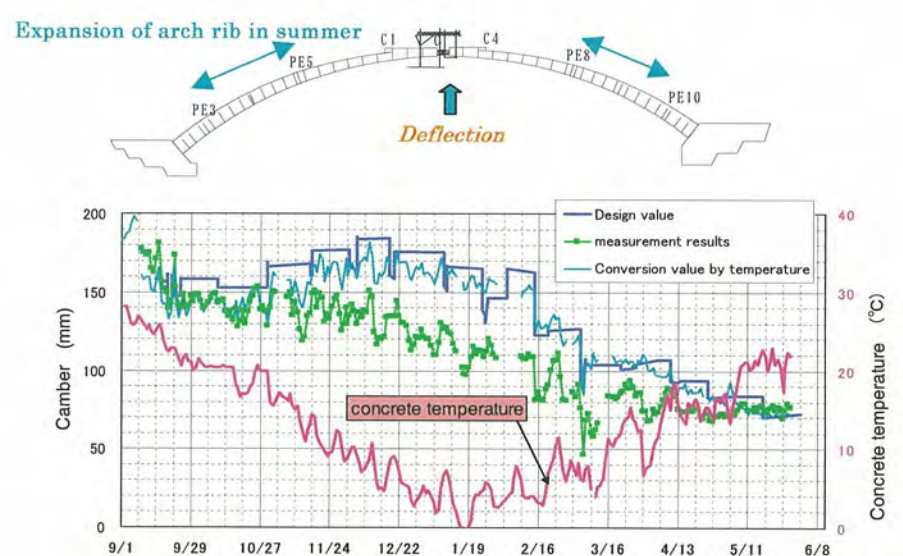
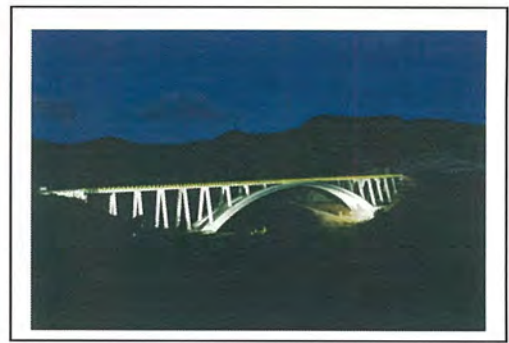
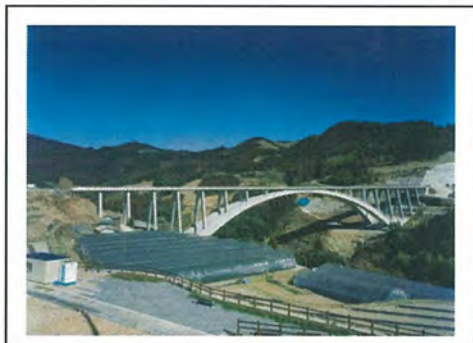
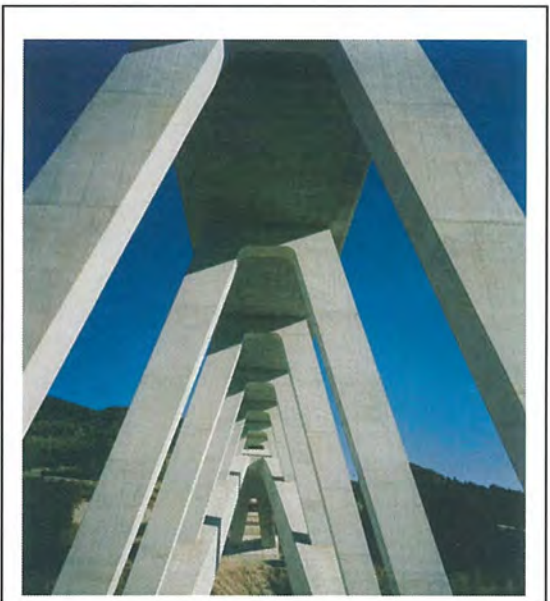


Fig.8 Arch rib camber during concrete jacketing

OBORO CONCRETE ARCH BRIDGE



A design with a feeling of a lively motion



Bifurcated arch ribs

People of Jojo consider this bridge as the symbol.

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