

Replacement of the “Pomezia” bridge at Km 24+396 of the Rome-Formia line

Pomezia, Italy

65% Engineering



5% Architecture



30% Geology - Geotechnics



Subcontractor: ETS S.r.l.

Contractor: Micos spa

Contracting Authority:

RFI - Rete Ferroviaria Italiana

Works designed:

Replacement of the “Pomezia” bridge at Km 24+396 of the Rome-Formia line

Place of realisation of the works designed:

Municipality of Pomezia [Rome]

Period of provision of the service:

2017-2019

Value of the works designed:

€ 4,300,000.00

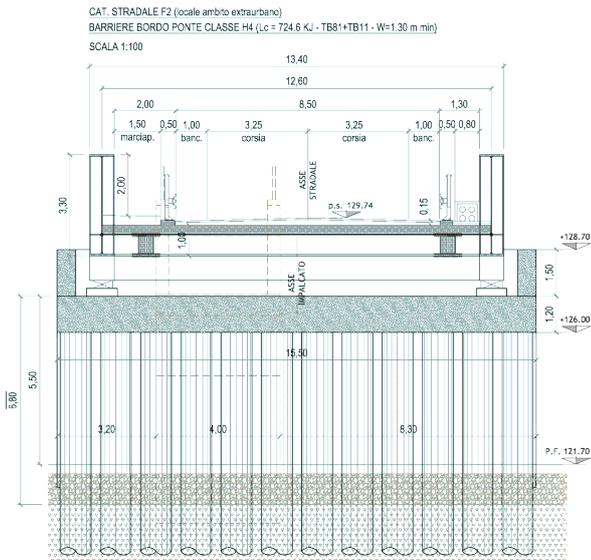
DESCRIPTION OF THE SERVICE PROVIDED

The project concerned involved the upgrading to current clearance requirements of an existing three-arch brick-work bridge over the railway, within the European Union TEN-T Scandinavian-Mediterranean corridor. When the new PC80 outline was superimposed on the geometrical form of the existing bridge, a lack of clearance was found in the shoulders of the central archway, with the opening now required including almost the entire 70 cm depth of the bearing arch. In view of this interference, and the deteriorated condition and the unsuitability of the cross-section of the existing bridge, the decision was taken to demolish the existing bridge and replace it with a new steel girder structure, which would not only resolve the clearance problems but also widen the roadbed to the standard required for two-way traffic. The new structure, with a single span of 40.0 m, would also eliminate the central masonry piers, which seriously restricted the space available for the tracks and for any further upgrading of the line.

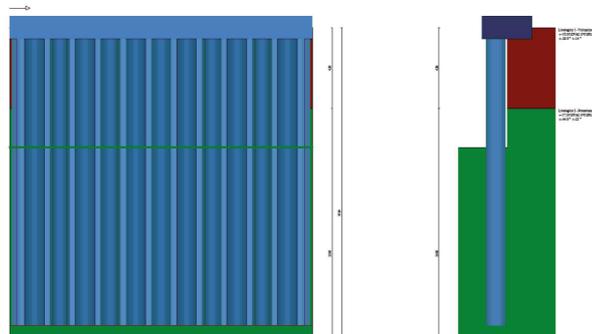
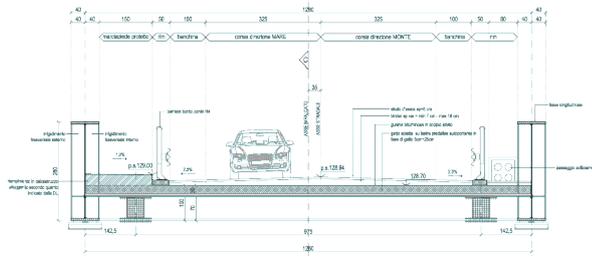
THE SERVICES PROVIDED BY ETS WERE

- preliminary study of the clearance corrections required;
- executive design of the new abutments and steel girder structure;
- application for planning permits from Heritage authorities (landscape and architecture).

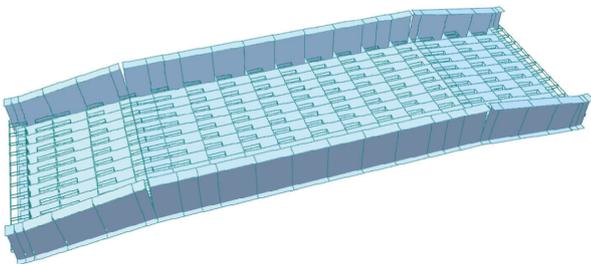
Cross-section of abutments ▼



Cross-section of roadbed ▼



Model of abutment ▲



Cross-section of steel girder structure ▲

CONSTRUCTION CHARACTERISTICS

Fixed abutment:

in reinforced concrete, consisting of 31 piles 1.0 m in diameter, height above the ground 5.50 buried to a depth of 10.50 m, connected at the top by an impost beam designed to take a fixed bearing and a unidirectional sliding bearing facing across the steel girder structure.

Mobile abutment:

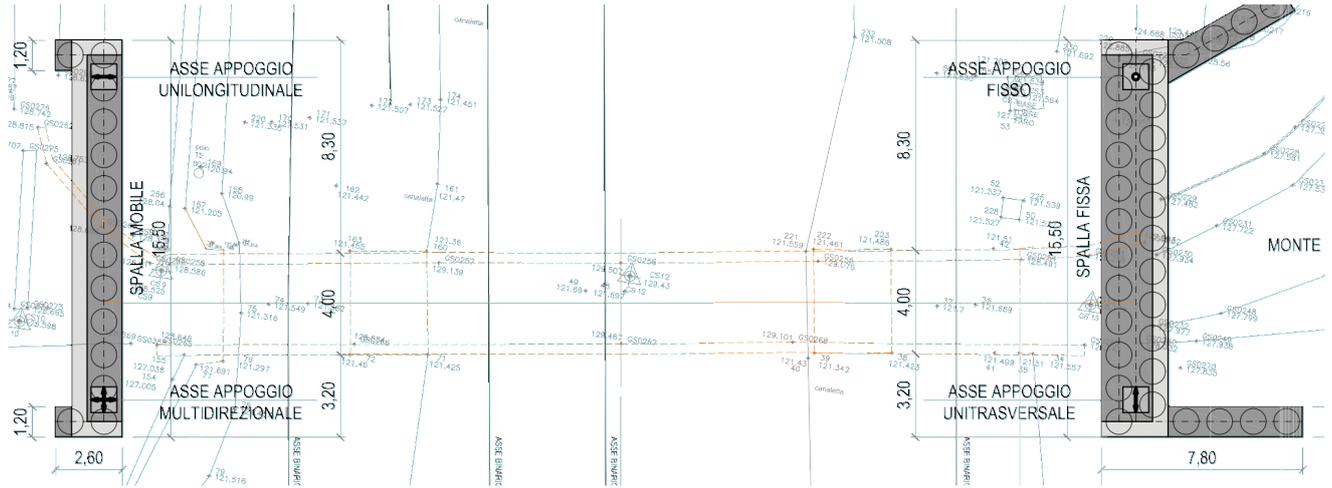
in reinforced concrete, consisting of 14 piles 1.0 m in diameter, height above the ground 5.50 buried to a depth of 10.50 m, connected at the top by an impost beam designed to take a unidirectional longitudinal bearing and a multidirectional bearing for the steel girder structure.

Steel girder structure:

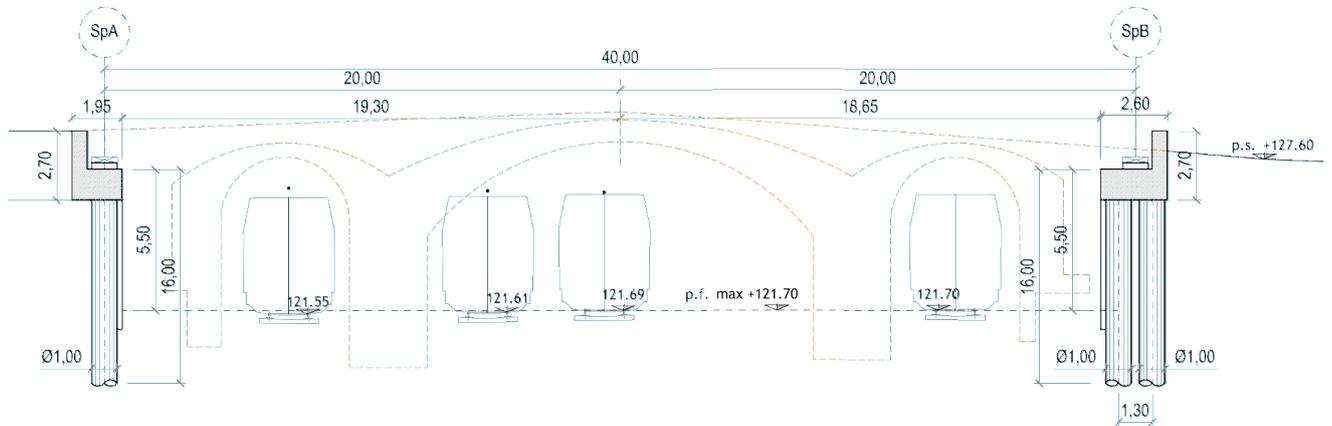
consisting of steel girders with superstructure, with a single span of 40.00 m, maximum dimensions across the deck 13.40 m, cross-beams installed at an interval of 2.50 m and reinforced concrete structural deck of 30 cm.

TABELLA PESI (incrementati del 20%)		
peso totale delle travi principali (compresi irrigidimenti)	183 500	kg
peso totale traversi	72 870	kg
peso lastre predalles (sp=5cm)	66 800	kg
peso getto (sp=25 cm)	389 400	kg
peso preadells + getto	456 000	kg

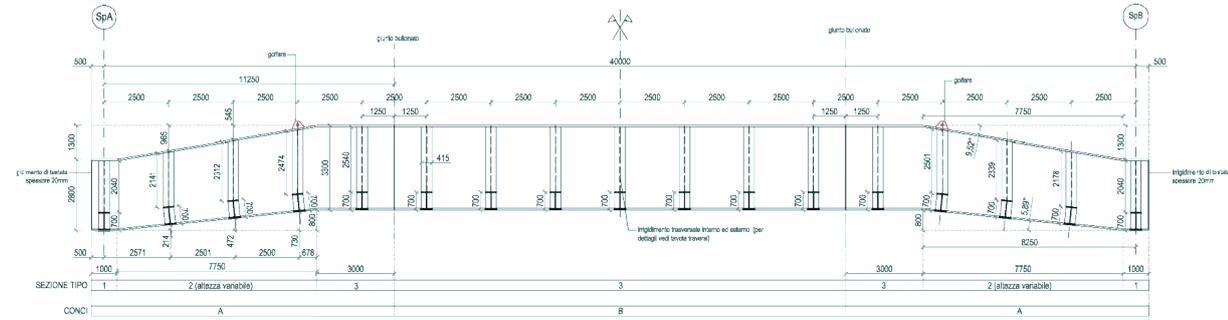
Ground plan of abutments



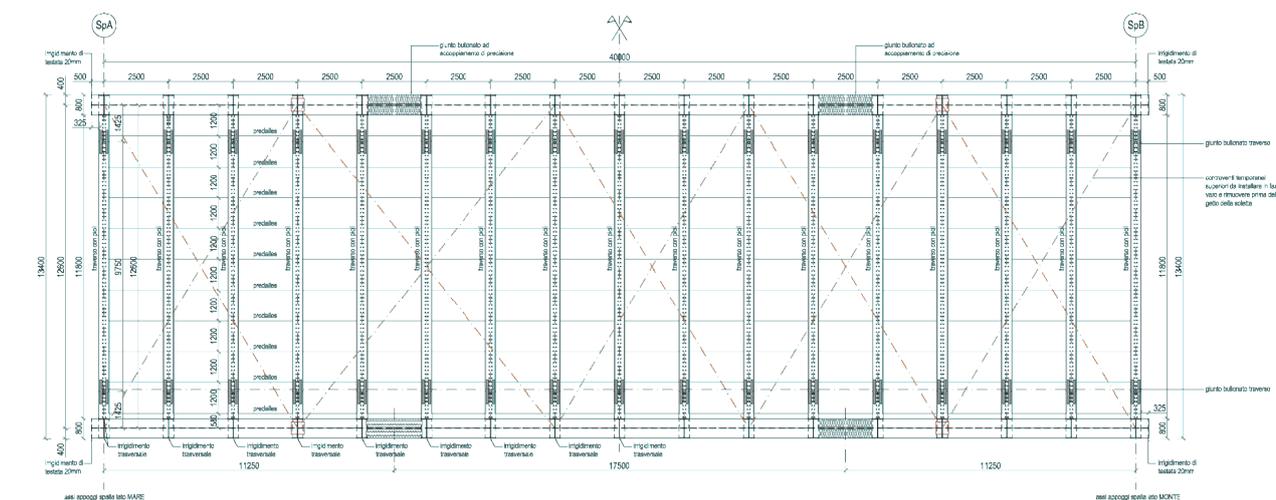
Perspective drawing of abutments

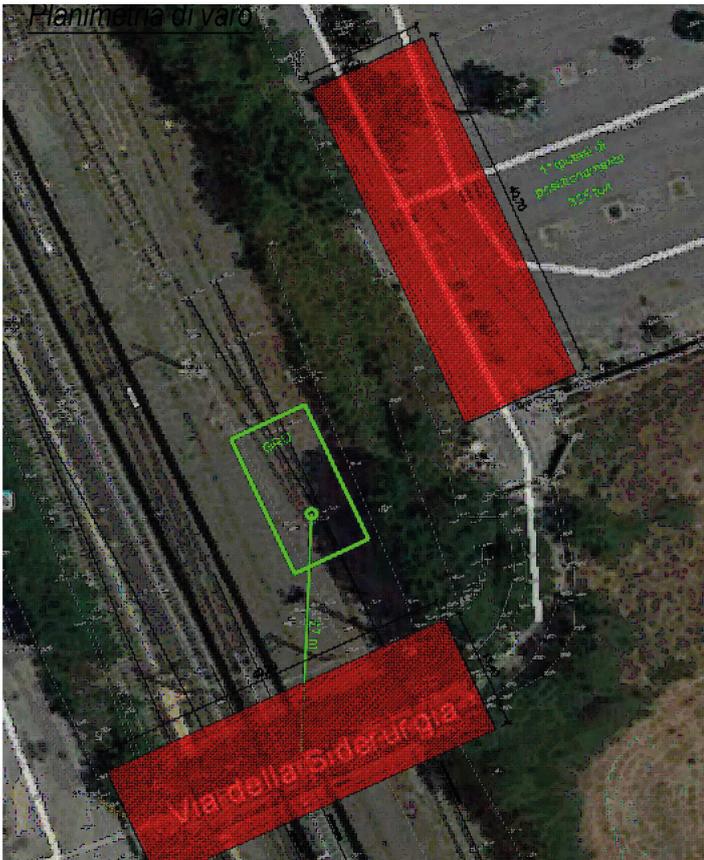


Perspective drawing of steel girder structure



Ground plan of steel girder structure





OPERATING PHASES

1- Creation of construction site;

2 - Construction of reinforced concrete abutments; the new abutments were constructed in reinforced concrete, with diameter of 1.0 m, topped by an impost beam; they were constructed next to the brickwork abutments prior to demolition of the existing bridge, to avoid interference with them and to allow work to be conducted with the line in operation;

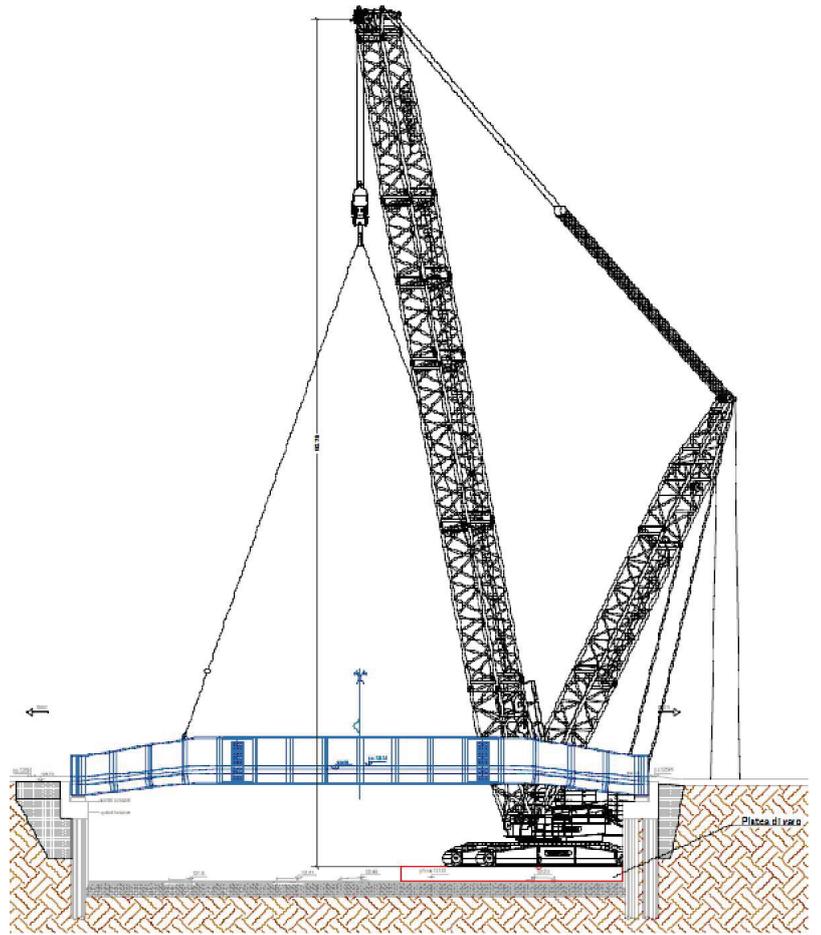
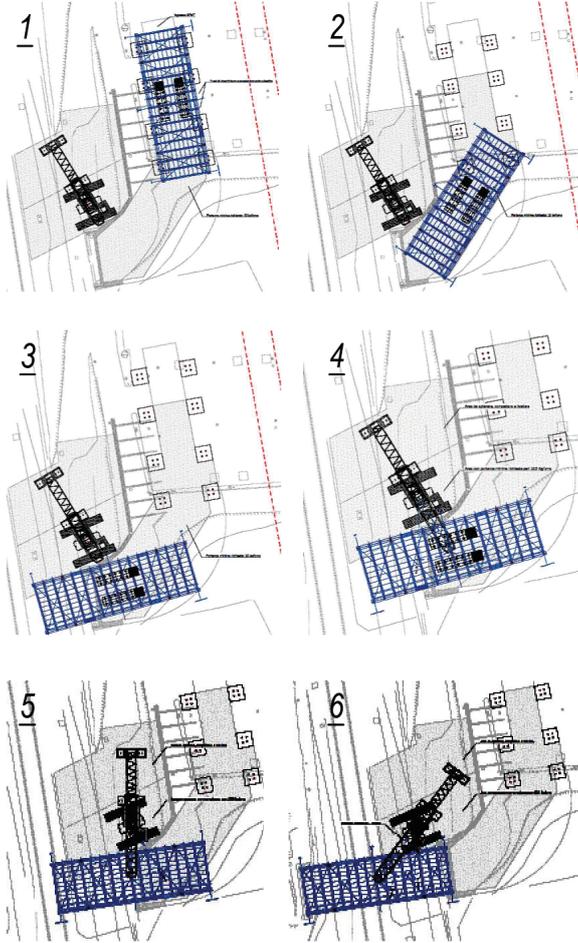
3 - Demolition of the existing bridge: this operation was carried out with the railway line closed, after construction of the new reinforced concrete abutments;

4 - Construction and assembly of the new steel girder structure on the ground on site;

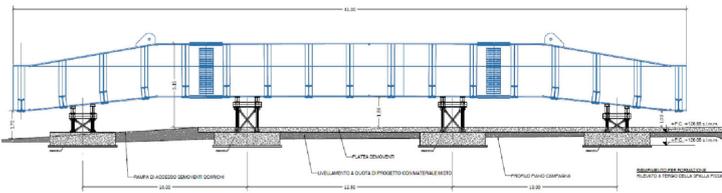
5 - Transfer into position of the new steel girder structure; special lifting equipment was used to place the new steel structure on the reinforced concrete abutments;

6 - Completing works: once the steel girder structure had been positioned, the reinforced concrete structural deck was cast and the roadbed was repaved, both on the bridge and on the connections with the existing roadways.

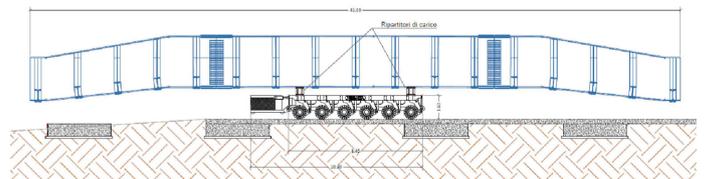
Transfer of girder structure into position



Pre-assembly position



Lifting onto transporters



PROJECT TECHNICAL SPECIFICATIONS

Replacement of the "Pomezia" railway bridge
on the Rome-Formia railway line, Italy

PROJECT DATA:

Contractor: Micos S.p.A. - CR Costruzioni srl
Contracting Authority: RFI - Rete Ferroviaria Italiana
Place: Pomezia, Italy
Type of Project: Transport, Retail, Restyling
Award: 2016 Tender
Design: 2017/2018
Status: Completed
Total weight: 716 ton
Dimension: 40 m

PROJECT MANAGEMENT:

Project Manager: Ing. Isabella Bongi
Architectural Design: Arch. Marco Terracciano
Design of Structures: Ing. Isabella Bongi

PROJECT TEAM:

Ing. Andrea Mattarollo
Ing. Matteo Biagio Di Prima



ETS s.r.l.
Registered office: Via Appia Nuova 59 - 00183 - Rome - Italy
Operational office: Via Belice 9/11 - 04100 - Latina - Italy
Operational office: Via Casati 32 - 20124 - Milano - Italy
Ph +39 07731751640 - Fax +39 07731751641
www.etsingegneria.it - info@etsingegneria.it