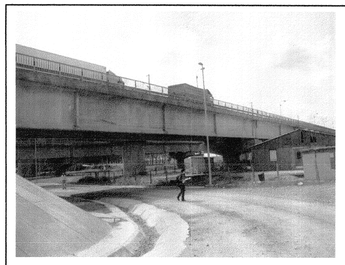
INTERVENTION WORK: C6- STRUCTURAL STRENGTHENING - CONCRETE BEAMS

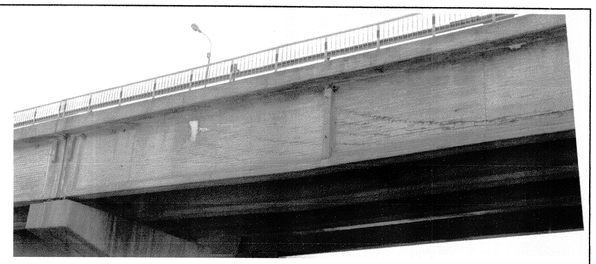
The item covers the following activities:
- procurement, transport,storage and handling of all related materials and equipment;
- application of a bicompound epoxy primer;
- application of coats of epoxy adhesive for bonding new concrete with CFRP laminates and trasverse straps;
- application of CFRP laminates in bottom external prestressed beams;
- application of CFRP straps arounding external prestressed beams;
- verifications after execution in accordance to the design;

Note: This intervention must be executed simultaneously to C2 intervention work, first of the epoxy and polyurethane compounds application.

DETERIORATION:



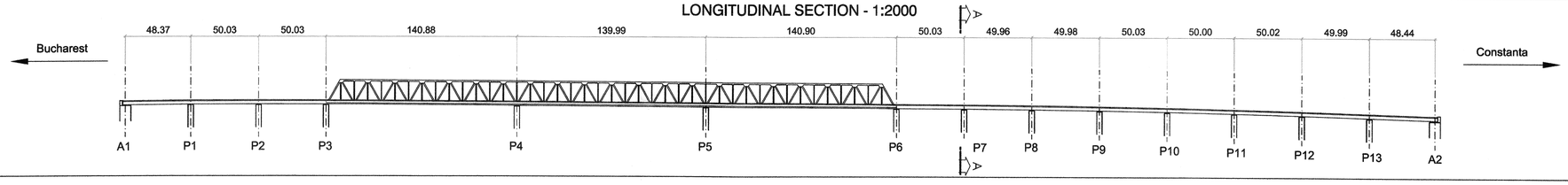
Cracking on prestressed concrete beam



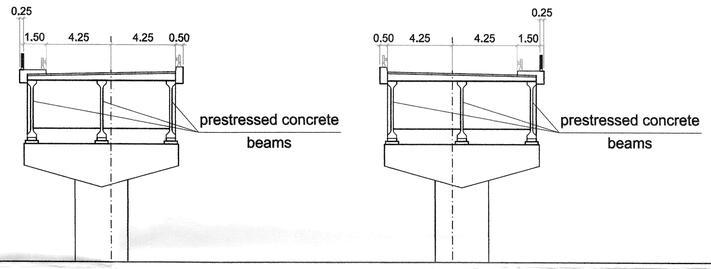
Cracking on prestressed concrete beam

GENERAL VIEWS

LONGITUDINAL SECTION - 1:2000



VIADUCT TRANSVERSAL SECTION (A-A) - 1:200

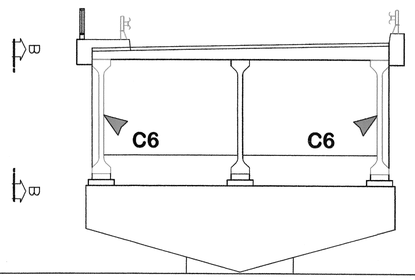


WORKING CODE LIST

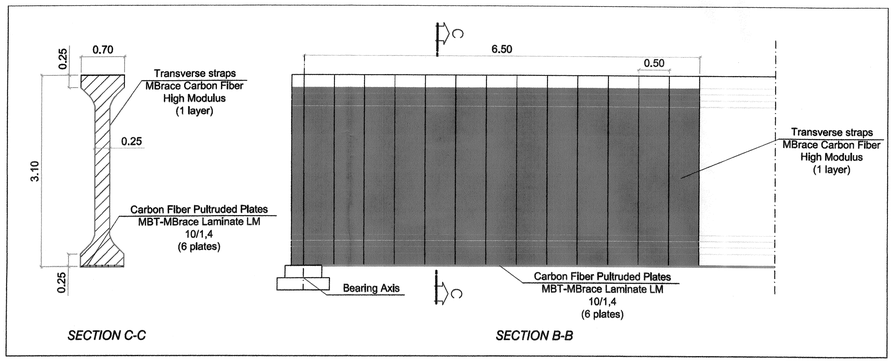
CODE	MAINTENANCE AND REHABILITATION WORKS	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
	ROAD FINISHES AND EQUIPMENT										
A1	Painting of pedestrian parapet										
A2	Replacement of pedestrian parapet										
A3	Guard rail replacement										
A4	Electrical equipment replacement										
A5	Walkway slab substitution										
	PAVEMENTS										
B1	Roadway pavement and waterproofing replacement										
B2	Roadway superficial drainage rehabilitation										
B3	Walkway pavement replacement										
B4	Expansion joints replacement										
B5	Bearings replacement										
	CONCRETE REPAIR										
C1	Deck slab repair										
C2	Prestressed concrete beams repair										
C3	Pier caps concrete repair										
C4	Piers concrete repair										
C5	Tower leg concrete repair										
C6	Structural strengthening								■		
C7	Superstructure replacement										
	STEEL WORKS										
D1	Painting of steel structures										
D2	Stay cables maintenance										
D3	Strengthen of anchor bolts										
D4	Rehabilitation of inspection gantry and rails										
	EARTHWORKS										
E1	Ashlar stoneworks repair										
E2	Repair of strutture connection with embankment										
E3	Cone quarters rehabilitation										
E4	Rehabilitation of storm water collecting system										
E5	River bank improvement										

INTERVENTION DETAILS

THIS INTERVENTION MAY BE EXECUTED ON EXTERNAL BEAMS OF ALL CONCRETE SPANS OF CONSTANTA SIDE ON BOTH CARRIAGEWAYS



INTERVENTION LOCATION - 1:100



SECTION C-C *SECTION B-B*

INTERVENTION SCHEME ON VIADUCT EXTERNAL PRESTRESSED CONCRETE BEAMS - 1:50



	MBT-MBrace Laminate LM 10/1,4	MBrace Fiber High Modulus
Fiber Type	Carbon	Carbon
Nominal Thickness (mm)	1,4	0,165
Tensile Modulus (GPa)	165	390
Tensile Strength (MPa)	2300	2500
Ultimate Strain (%)	1,8	0,8

PROPERTIES OF CFRP COMPOSITE SYSTEMS

IVANESCU T. TOMA ROMANIA MEMBRU OCPI NR. 445 INGINER VERIFICATOR PROIECTE

16-11-2008

INVESTOR/INVESTITOR

ROMANIAN NATIONAL COMPANY OF MOTORWAYS AND NATIONAL ROADS
COMPANIA NATIONALA DE AUTOSTRAZI SI DRUMURI NATIONALE DIN ROMANIA

DESIGNER/PROIECTANT

LOUIS BERGER GROUP inc.

CONSULTING SERVICES FOR DESIGN AND WORKS SUPERVISION OF 10 BRIDGES IN DOBROGEA AREA

TECHNICAL DESIGN

B08-BRIDGE A2 BORCEA

TD - B08 - 13

DESIGN TEAM LEADER
Vittorio Ascoli Marchetti

CONCRETE REPAIR

CONSULTANTS
SOLIDUS s.r.l. - Roma Italia
Francesco Del Tosto
Romano Tucci

C6
STRUCTURAL STRENGTHENING
CONCRETE BEAMS

scale	various	file name	TD - B08 - 13				
data / date	rev.	revision title		des	ver/chk	CP / PC	APPR. AUTHORITY
08 aug 2008	0	Issue		SOLIDUS	ASCOLI		