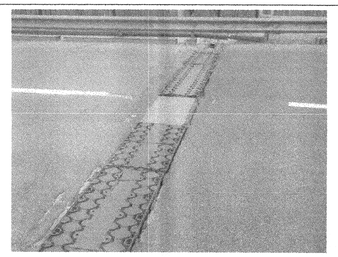
INTERVENTION WORK: B4- EXPANSION JOINTS REPLACEMENT

The item covers the following activities:
- removal of the existing expansion joints;
- loading and transport of the removal material to an approved dump area;
- procurement, transport and handling of the expansion joint devices and the necessary materials;
- formworks manufacturing, installation and dismantling;
- reinforcement steel bars manufacturing and installation;
- concrete production, transport and casting;
- concrete quality control;
- concrete protection during the curing period;
- expansion joints installation in accordance with the supplier technical documentation;
- control of the expansion joint positioning in respect to the design;
- sampling and laboratory testing.

DETERIORATION:

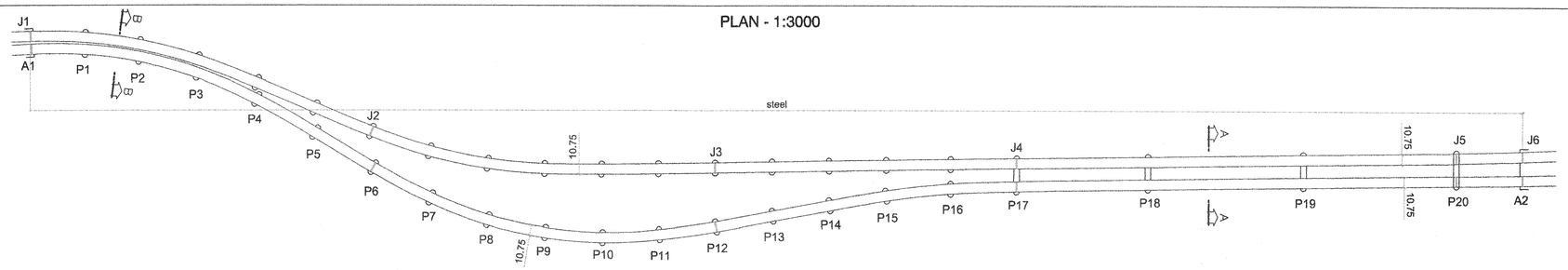


Damaged expansion joint

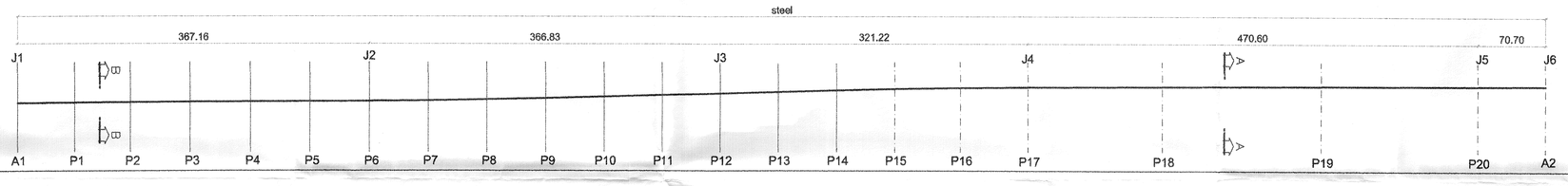
IVANESCU T. TOMA ROMANIA MLRAT DCLP NR. 445 INGINER VERIFICATOR PROIECTE

GENERAL VIEWS

PLAN - 1:3000



LONGITUDINAL SECTION - 1:3000



WORKING CODE LIST

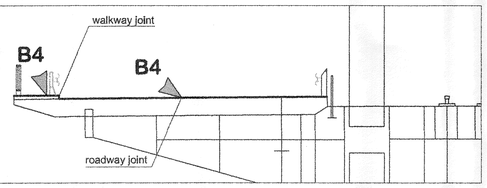
14-11-2008

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

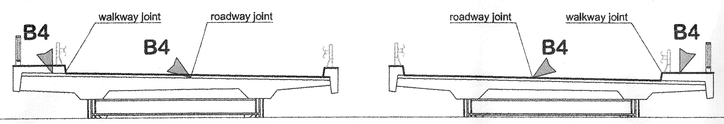
GP 50 TYPE EXPANSION JOINT - on J4 *
FE C 500 TYPE EXPANSION JOINT - on J5 *

* on both roadways

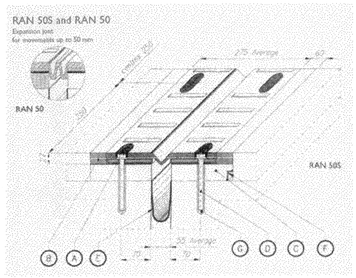


INTERVENTION ON J4 AND J5 EXPANSION JOINTS - Transversal Section A-A - 1:100

RAN 50 TYPE EXPANSION JOINT - on J1, J2, J3 and J6

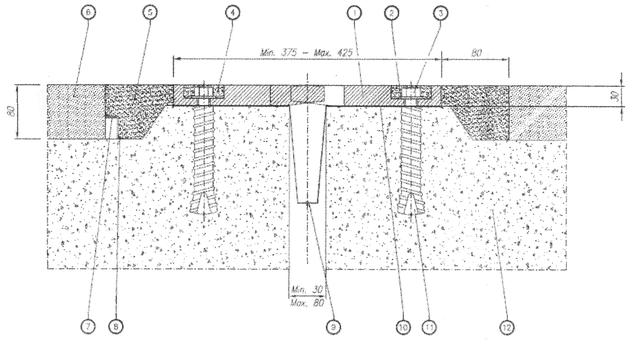


INTERVENTION ON VIADUCT EXPANSION JOINTS - Transversal Section B-B - 1:100



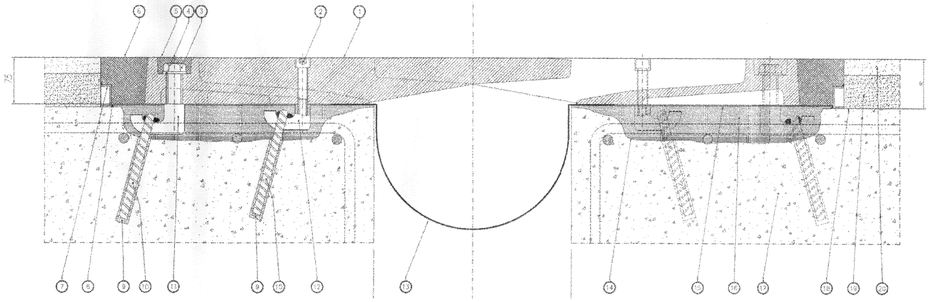
RAN 50 type Expansion Joint from FIP Industriale

A - Sealant
B - Transition strip
C - Morar bedding
D - M12 or M16 threaded bar or other
E - Gutter
F - Water drainage channel
G - Anchoring epoxy resin



GP 50 type Expansion Joint from FIP Industriale

1 - Finger Element
2 - Washer
3 - Fixing bolt M16
4 - Bolt head seat sealing
5 - Epoxy mortar nosing
6 - Asphalt
7 - Drainage L shaped profile
8 - Putty
9 - Stainless steel drainage gutter
10 - Levelling Putty
11 - Sochet
12 - Deck end



FE C 500 type Expansion Joint from FIP Industriale

1 - Finger Element
2 - Fixing bolt M16
3 - Fixing bolt M24
4 - Washer
5 - Bolt protection cap
6 - Resin mortar nosing
7 - Water drainage groove
8 - Putty
9 - Injected fixing system
10 - Anchoring Hooh
11 - Multidirectional anchorage M24
12 - Multidirectional anchorage M16
13 - Drainage gutter
14 - Bonding layer
15 - Waterproofing by epoxy resin
16 - Mortar levelling
17 - Deck end
18 - Deck waterproofing membrane
19 - Binder
20 - Wearing course

NEW EXPANSION JOINTS DETAILS

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

B07-BRIDGE A2 CERNAVODA

TD - B07 - 08

DESIGN TEAM LEADER
Vittorio Ascoli Marchetti

DOTT. ING. VITTORIO ASCOLI MARCHETTI ORDINE INGEGNERI ROMA N° 12645

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

PAVEMENTS

B4
EXPANSION JOINTS REPLACEMENT

scale	various	file name TD - B07 - 08				
data / date	rev.	revision title	des	ver/chk	CP / PC	APPR. AUTHORITY
08 aug 2008	0	issue	SOLIDUS	ASCOLI		