PROJECT

Bridges research package - EP 6: skirtings and edge terminations as well as connections on mountings (VSS2006/516_OBF)

Forschungspaket Brückenabdichtungen - EP 6: Randanschlüsse und Randabschlüsse sowie Anschlüsse an Einbauten

Funding: National (Switzerland)
Duration: Sep 2009 - Oct 2014
Status: Complete with results

Background & policy context:

The EK 5.10 has, when writing the standard SN 640 450, the edge connections and connections to fixtures not treated, although the execution of these details for the functioning of the waterproofing system is of great importance. The crucial reason was the diversity of existing systems, combined with a lack of standardization for the relevant data (collected experience objective background on the various systems).

The research project is planned as thorough study of work, because of the Preparatory Commission believes that therefore standardisation required information is scattered in many national and international documents available (literature, documents of professional associations, manufacturer instructions, experience of builders).

Objectives:

The main goal of the single project is to study

- Which systems are basically suitable for edge connections to waterproofings and fittings
- With what systems of a functioning edge connections, dense and permanent connection to improvements can be achieved
- How the systems concerning site suitability (temperature and humidity) can be assessed
- How the connections in situ can be reviewed resp. checked
- What is the long-term experience with various systems (survey)

Parent Programmes:
ARAMIS - ARAMIS information system

Institute type: Public institution
Institute name: Swiss Government: State Secretariat for Education and Research
Funding type: Public (national/regional/local)

Partners:
Switzerland
Swiss Federal Roads Office
CES Ingenieur AG

Organisation: CES Ingenieur AG
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Key Results:

The edge connections of concrete bridge deck waterproofings are indisputably of crucial importance to the proper functioning of the waterproofing because the load-bearing structure can be effectively protected by these against physical (moisture) and chemical (sodium) ingress.

Damage may occur if there are leaks in the waterproofing or their connection and it may only be repaired through maintenance work causing considerable expense and with inconvenient restrictions on traffic. If the project is planned carefully with well-thought out systems and is carried out with great expertise using high-quality materials, maintenance measures can be significantly reduced, on the other hand, allowing considerable costs to be saved over the long term.

There are a large number of various details relating to the connection, however, one does not know, which one of these connections are suitable for long term use and therefore applicable. The objective of this work is to use material tests on various existing bridge structures to find out how different connecting details have held up over long years of usage. The results should then allow recommendations to be formulated for the use of tried and-proven, properly functionally connection details. The results are thus primarily addressed to the project planners.

As criteria for the proper functioning of the connections for the bridge waterproofing, the research office selected chloride salt impact on the concrete protected by the waterproofing.

Three drill cores were taken in each cross-section examined:

One horizontal drill core above the waterproofing connection. These areas are subjected to physical (temperature, moisture), chemical (sodium) and biological impact without protection during the period of use.

A horizontal drill core below the waterproofing connection. If the waterproofing is tight, no chloride salts should theoretically be found here.

A vertical drill core in the concrete bridge deck. The task in this material testing is to determine whether contaminants are seeping through the waterproofing into the concrete bridge deck.

The Federal Roads Office (FEDRO) provided the research office a list of bridges which had been repaired during the period in which this individual project EP 6 was being carried out. Several structures were selected from this regarding which the proper functioning of several connection details subjected to several years of road traffic and weather could be destructively tested.

Related Projects:

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/511_OBF
Project title Forschungspaket Brückenabdichtungen: EP1- Standfester Gesamtaufbau, Prüfung und Bewertung

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/512_OBF

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/513_OBF
Project title Forschungspaket Brückenabdichtungen - EP3: Langzeitverhalten des Verbundes

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/514_OBF
Project title Forschungspaket Brückenabdichtungen: EP4: Zerstörungsfreie Prüfungen, Beurteilung von Verbund und Oberflächen Project title (in English) Non-destructive testing and evaluation of adhesion and surfaces

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/515_OBF
Project title Forschungspaket Brückenabdichtungen: Abdichtungssysteme und bitumenhaltige Decken

Project title (in English) Mechanism of Blister Formation

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number VSS2006/509
Project title Forschungspaket Brückenabdichtungen: Abdichtungssysteme und bitumenhaltige Decken
Auf Betonbrücken; Initialprojekt

Research organisation: Swiss Federal Roads Office; Research Roads-Bridges-Tunnels
Project number http://www.aramis.admin.ch/Grunddaten/?projectid=2337

Documents: 
21529_1489_Inhalt.pdf (Final report)

STRIA Roadmaps: Other specified

Transport mode: Road transport

Transport sectors: Passenger transport, Freight transport

Geo-spatial type: Urban