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EXPERIENCE IN DRY SUB-TROPICAL CONDITIONS

Expérience dans un régime sec et subtropical

Erfahrungen in trockenen subtropischen Verhältnissen

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The River Tigris is crossed at Amara in Lower Iraq by a welded steel, double cantilever bridge which was opened to traffic in December, 1957. It provides one 9 m carriageway and two 3 m footways. The orthotropic deckplate forming the carriageway has a uniform thickness of 19 mm of which 2 mm is an allowance for corrosion. The deckplate which is surfaced by a rolled gravel asphalt carpet is stiffened longitudinally by torsion free stringers spaced at 370 mm centres and serves as the top flange of the stringers and cross girders and with the stringer acts as the main girder top flange. The upper surface of the deck is plain without key ribs. The maximum gradient is 4 per cent.

At the time of construction of the bridge little was known of the behaviour and life of asphalt carpets laid on steel decks; some designers had applied steel mesh to act as a key, while others laid the carpet directly on the plate.

Lower Iraq is an area of low rainfall; annual precipitation hardly exceeds 250 mm. Temperatures range between 0°C at night in winter to above 40°C in summer.

Following recommendations by Dr. R. S. Millard, Deputy Director of the British Road Research Laboratory, which were based on his experience in tropical conditions, a 5 cm thick rolled gravel asphalt carpet was laid on the carriageway. This operation was carried out in October 1957. Particulars are as follows:

The shot blasted and shop painted upper surface of the deck was swept clean and dry and immediately sprayed with cut-back bitumen, which gave a good bond between steel and carpet which was asphalted in a single course by Barber-Greene finisher travelling at 76 cm sec. in accordance with B.S. 594 : 1950, the asphaltic cement being in accordance with Table 13 therein. This heated the deck so much that differential expansion caused the cantilever noses to dropp temporarily by 3 cm.

The Local Authority responsible for the bridge has reported on the condition of the carpet after ten years service as follows: "Apart from surface dressing which is quite usual, no repairs or renewals have been undertaken. Surface dressing is usually done in Iraq after two years."

The traffic, although heavy at times of pilgrimage, does not exceed 10,000 units per day as an annual average. The carpet, however, has to resist the penetration of hooves of draught, pack and other domestic animals and occasionally of tracked vehicles. The good performance of this asphalt wearing surface is to the credit of the firm who laid it - Morison Knudsen.

SUMMARY

The Amara Bridge spanning the River Tigris in Iraq has been in service for ten years. The orthotropic steel deck forming the carriageway is surfaced with rolled asphalt according to B.S.594 (1950) laid on the shop painted and primed steel surface, in accordance with recommendations based on experience furnished by the British Road Research Laboratory Tropical Division.

The traffic although heavy at times of pilgrimage does not exceed 5000 units per day per lane as an average. The wearing surface which has also to resist the penetration of hooves of draught, pack and other domestic animals, remains in good condition.

RESUME

Le Pont d'Amara qui franchit le Tigre en Irak est en usage depuis dix ans. Le tablier d'acier orthotropique formant la route carrossable est couvert d'asphalte cylindré selon le B.S.594 (1950). La surface de l'acier fut imprégnée et peinte d'avance dans l'atelier, ceci suivant les recommandations basées sur l'expérience acquise par la Division Tropicale du Laboratoire Britannique des Recherches Routières.

La circulation, quoique intense aux temps de pèlerinage, ne dépasse pas, en moyenne, 5000 unités par voie et par jour.

La surface frottante qui doit également résister à la pénétration des sabots des animaux de trait et de bât, se maintient en bon état.

ZUSAMMENFASSUNG

Die Amara-Brücke über den Tigris in Irak befindet sich seit 10 Jahren in Betrieb. Die Fahrbahn, die aus einer orthotropen Platte besteht, ist nach B.S.594 (1950) mit Walzasphalt überzogen, welcher auf die in der Werkstatt gestrichene und grundierte Stahloberfläche aufgebracht ist, gemäß der auf Erfahrung gegründeten Empfehlungen der Tropischen Abteilung der British Road Research Laboratory (Britische Forschungsanstalt für Straßenbau).

Obwohl der Verkehr durch Wallfahrten zeitweilig sehr stark ist, werden im Durchschnitt täglich 5000 Einheiten pro Spur nicht überschritten. Die Verschleißschicht, die ebenso dem Eindringen der Hufe von Zug-, Saum- und anderen Haustieren widerstehen muß, bleibt in gutem Zustand.