Countournement de Couvin

Worksite Visit
9 November 2018
Bypass of Couvin

- Video TRBA
- Bypass of Couvin
Bypass of Couvin

- 2nd phase
- Section between ‘La Platinerie’ and French border (5100 – 13700)
- 200 000 m² CRCP on sandwich layer
  - Thickness: 23 cm
    - Top layer: 6 cm
    - Bottom layer: 17 cm
  - Width: 10,05 m
  - 31 working days
Bypass of Couvin

- Bottom layer
  - Thickness: 17 cm
  - Cement: min 375 kg/m³ CEM III/A 42,5 LA
  - Air: 3%-6%
  - W/C: max 0,45
  - Dmax: 32 mm (limestone)
  - 2 types of natural sand (0/2 – 0/4)
  - W_{ai,max} : /
  - R_{i,min} 7 days : 26,9 MPa
  - R_{i,min} 28 days 39,6 MPa
Bypass of Couvin

✔ Top layer

- Thickness: 6 cm
- Cement: min 425 kg/m³ CEM III/A 42,5 LA
- Air: 5%-8%
- $W_{ai,\text{max}}$: 6.8 % - $W_{am,\text{max}}$ 6.3 %
- W/C: max 0.42
- Dmax: 6 mm (porphyry)
- 2 types of natural sand (0/2 – 0/4)
- Fresh on fresh
- $R_{i,\text{min}}$, min 7 days: 27.2 MPa
- $R_{i,\text{min}}$, min 28 days: 40 Mpa
- Exposed aggregate concrete
Bypass of Couvin

CRCP

- Longitudinal bars: diam. 20 mm, every 180 mm
- Transverse bars: diam. 16 mm, every 700 mm
- Distance between longitudinal bars and surface: 90 to 100 mm
- Alpha: 60°
- Anchorage abutment: at the end of the section
Bypass of couvin: essential factors

- Quality
  - Adequate materials: aggregates, sand, admixtures
  - Constant mixture of concrete
  - Control of humidity
  - Constant supply: transport

Ideal: plant on jobsite
Bypass of couvin: essential factors

Quality
- Adequate materials: aggregates, sand, admixtures
- Constant mixture of concrete
- Control of humidity
- Clear and smooth track paths

Ideal: plant on jobsite
Bypass of couvin: essential factors

Quality
- Adequate materials: aggregates, sand, admixtures
- Constant mixture of concrete
- Control of humidity
- Constant supply: transport
- Clear and smooth track paths
- Experienced craftsmen

Ideal: plant on jobsite
Bypass of couvin: essential factors
  ○ Quality
    ▪ Modern and adequate material
Bypass of Couvin

- Equipment
  - Mobile concrete plant: 160 m³ (for both top layer and bottom layer)
  - Nearby the jobsite
  - Produces only for 1 jobsite, not commercial
  - 1200 m³/day
Bypass of Couvin

- Equipment: adequate to width (10.05 m)
- Bottom layer: SP 1500
  width: up to 15.5 m
  weight: 70 tonnes
Bypass of Couvin

- Equipment adequate to width
- Top layer: SP 850
  width: up to 10 m
  weight: 50 tonnes
Bypass of Couvin

- Equipment adequate to width
- Drion CCF 600-4
  width: up to 6.3 m
  weight: 40 tonnes
  Ramp to highway
  one layer
Bypass of Couvin

- Joints (longitudinal bending joints, no longitudinal construction joints)
  - Saw cutting
  - Sealing
  - Maintenance
Bypass of Couvin

- Protection of fresh concrete
  - Plastic sheet – right after pouring of the concrete
  - Curing – after aggregate exposure (washing out of the surface)
Bypass of Couvin

- CRCP General
  - Second life
    - Recycling of the steel
    - Recycling of the aggregates (suitable for new pavement concrete!)
  - Delay (until 15.5 m width)
  - Challenge of quality: noise
    - Composition
    - Adequate machines
Bypass of Couvin

The idea that CRCP is more noisy than asphalt belongs definitively to the past...
Bypass of Couvin

Questions??
Thank you for your attention!!