### Countournement de Couvin

## Worksite Visit 9 November 2018



# Video TRBABypass of Couvin



- ✓ 2<sup>nd</sup> phase
- ✓ Section between 'La Platinerie' and French border (5100 – 13700)
- ✓ 200 000 m<sup>2</sup> CRCP on sandwich layer
  - Thickness: 23 cm
    - Top layer: 6 cm
    - Bottom layer: 17 cm
  - Width: 10,05 m
  - 31 working days



- ✓ Bottom layer
  - Thickness: 17 cm
    - Cement: min 375 kg/m<sup>3</sup> 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)
    - Wai,max:/
    - Ri,min 7 days : 26,9 MPa
    - Ri,min 28 days 39,6 MPa



- ✓ Top layer
  - Thickness: 6 cm
    - Cement: min 425 kg/m<sup>3</sup> CEM III/A 42,5 LA
    - Air: 5%-8%
    - Wai,max: 6,8 % Wam,max 6,3 %
    - W/C: max 0,42
    - Dmax: 6 mm (porphyry)
    - 2 types of natural sand (0/2 0/4)
    - Fresh on fresh
    - Ri,min 7 days: 27,2 MPa
    - Ri,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







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#### ➢ Bypass of couvin: essential factors

- o 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

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

Ideal: plant on jobsite





### ➢ Bypass of couvin: essential factors

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



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Ideal: plant on jobsite



# Bypass of couvin: essential factors Quality Modern and adequate material



- ✓ Equipment
  - Mobile concrete plant: 160 m<sup>3</sup> (for both top layer and bottom layer)
  - $\checkmark$  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 to15,5 m

width : up to15,5 m weight: 70 tonnes







# Bypass of Couvin ✓ Equipment adequate to width ✓ Top layer: SP 850

width : up to 10 m weight: 50 tonnes







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# 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 O 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



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

Mesures CPX sur E17			
vak	type de chaussée	ganée de construction	d(B)A
Enrobés			
E17 Deerlijk - Ghand	SMA C6	2003	100,3
E17 Courtrai - Frontière Française	SMA C6		101,0
E17 Courtrai - Frontière Française	SMA C1	2011/2012	98,8
E17 Courtrai - Frontière Française	SMA D2	2008	97,8
Béton ancienne formulation			
E17 Tems - St Niklaas.	BAC 0/20	2008	101,8
E17 De Pinte - Courtrai	BAC 0/20	2010	99,7
Béton nouvelle formulation			
E17 De Pinte Courtrai (TRBA)	BAC 0/20 4/6+	2011	99.0
E17 Deinze - Ghand (TRBA)	BAC 0/20_4/6+	2011	98,8
BAC	Béton Armée Co	ntinue	10 - 10 





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### Questions??



## >Thank you for your attention!!

