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Cold-In-Place Recycling Mix Design

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The Cold-In-Place Recycling Mix Design, we will discuss today has been:

- Developed by group State DOTs, CIPR Contractors, Emulsion Suppliers and others.
- Is being used by Nevada DOT & Caltrans (pilot studies).
- Adopted by 36th Pacific Coast Conference on Asphalt Specifications (PCCAS) as Guidelines for optional use – May 21, 2008.

☐ In addition to the Mix Design Guidelines, PCCAS also adopted Construction Guidelines.

☐ After job selection, getting pavement samples is the first step for the design.

- **☐** Pavement samples are normally:
 - \Box Core specimens 4 or 6"
 - ☐ Millings











CIR Mix Design-Suggested Targets for

Cold Recycling Gradation, % P,			
Sieve Size	Medium	Coarse	
1"	100	100	
3/4"	95 ± 2	85 ± 2	

1"	100	100
3/4"	95 ± 2	85 ± 2
# 4	50 ± 2	40 ± 2
# 30	10 ± 2	5 ± 2

 0.8 ± 0.3

 0.3 ± 0.3

#200

1"	100	100
3/4"	95 ± 2	85 ± 2
# 4	50 ± 2	40 ± 2
# 30	10 ± 2	5 ± 2

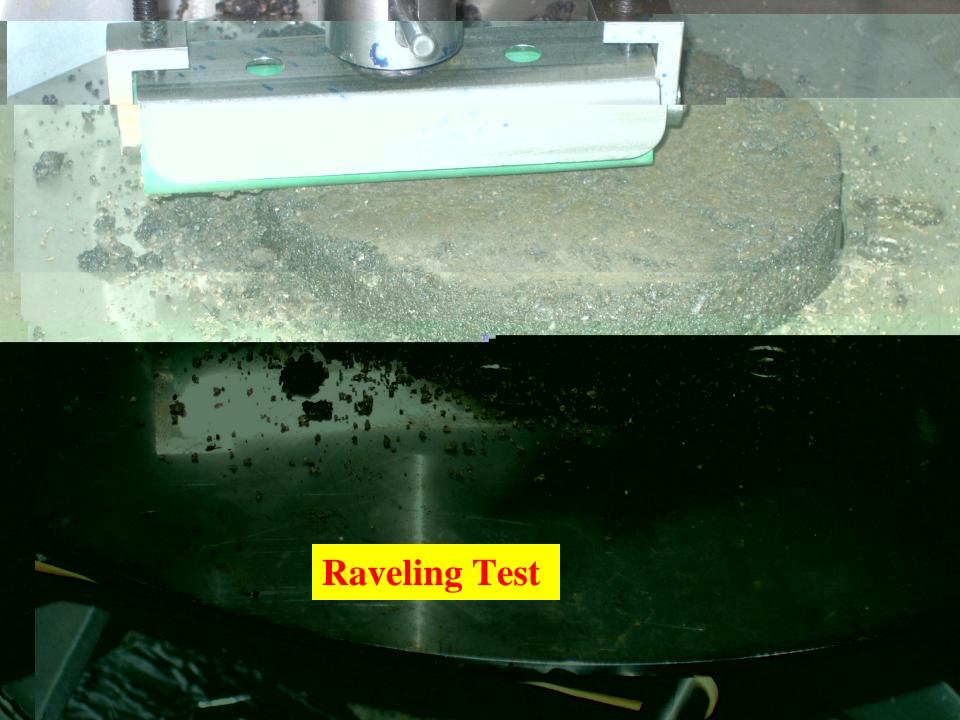
- Mix Design parameters:
 - Gradation of RAP passing 1" (others 1.25" or 0.75")-Report
 - Asphalt Content Report
 - Bulk Specific Gravity Report
 - Maximum Theoretical Specific Gravity Report
 - Air Voids Report (Normally 10-16%)
 - Marshall Stability, Cured Specimen 60°C from 16 –
 48 hours. 1,250 lbs. minimum

- Mix Design Parameters:
 - Marshall Retained Stability 70.0% minimum

Ratio of Emulsion Residue to Cement – 1.8 minimum

Raveling Test – 2.0% target value





- Other Considerations:
 - **❖** Just in time training (JITT)
 - ***** Emulsified Recycling Agent (ERA)

Asphalt binder used to make ERA must meet bending beam requirements of PG AASHTO M320. Verifying low temperature requirements where the RAC is placed.

- Emulsified Recycling Agent Requirements:
 - Sieve test 0.1% maximum

- Residue, w% (60.0 w% minimum no max.)

RAP Coating Test - Report

 Test on Residue – Pen. & Absolute Viscositytarget values

Questions?