R.A.P.

By:

Bureau of Materials

HISTORY

FIRST IDOT CONTRACT

EDENS EXPRESSWAY 1979-1980

- Reason
  - *Where & What – 15 miles of 6 lanes of Concrete & Bituminous Mixtures*
  - *100% Usage of Recovered Pavement*

USES

- P.G.E.
  - *100% of Crushed Concrete*
  - *100% RAP*
- Bituminous Mixtures
  - *Sub Base – Max 50%*
  - *Shoulder – Max 25%*

CURRENT PROBLEM

- Excess Bituminous & Concrete Recovered Pavement


Chicago drivers
are turning 21.
21st Century
Insurance


Chicago drivers
are turning 21


Chicago drivers
are turning 21

Alternate Uses

- Ski Hills
- Motor cross Events
  - *Hill Climbing*
- Four-Wheeling Events
- Tourist Attraction
  - *The Mountains of Chicago*

CURRENT USES

- Aggregate
  - *Type B Shoulder Stone*
  - *Capping Aggregate for P.G.E.*
  - *Blend of P.G.E. Crushed*
  - *Bituminous Mixtures*

PROPOSED USES

- Aggregate Blended with CA06 – "D" Quality
  - *Type B Sub Base*
  - *Base Coarse*

- Obstacles
  - *Quality Testing*
  - *CBR (IBR) 133√*

Changes in Current Recycling Spec to be Used

- Process – All materials to be crushed and screened to 3/8 for Bit Surface & Binder Mixes and 4.75mm mixes
- 3/4 to 3/8 for binder or material blended for other products

INCREASED % OF RECYCLE

- Bituminous Mixtures

LOW % OF RECYCLE

- Modified Binder
  - *Bituminous Mixtures*

Why it can be done

- Consistency of the materials
- Crushed
- Processed

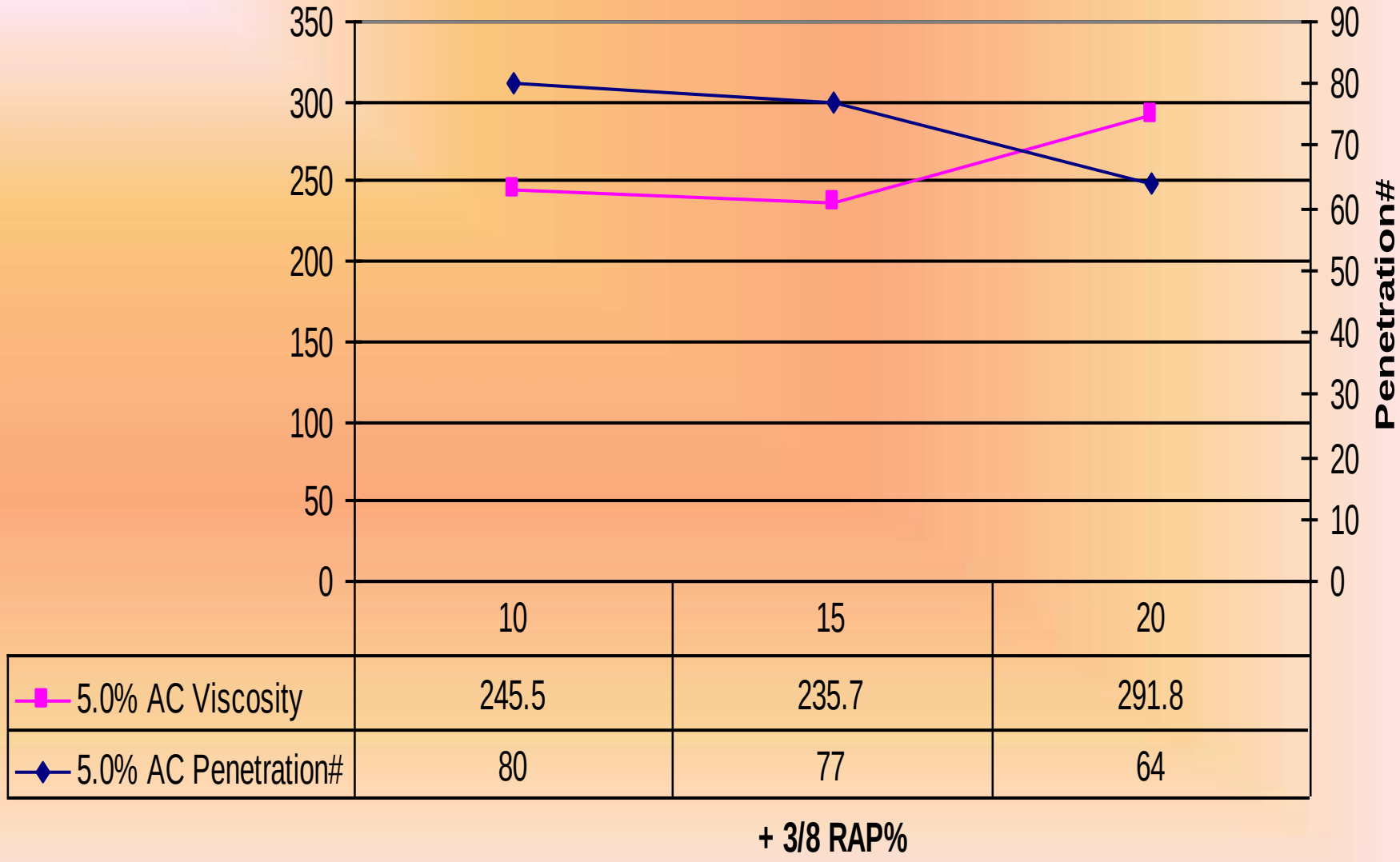
EFFECT ON RECLAIMED LIQUID

% RAP	% AC	Penetration	Viscosity	Virgin AC	Rec. Liquid
10	5.0	57	383.5	4.5	0.5
15	5.0	45	609.8	4.2	0.8
20	5.0	43	747.6	4.0	1.0
30	5.0	44	861.1	3.5	1.5

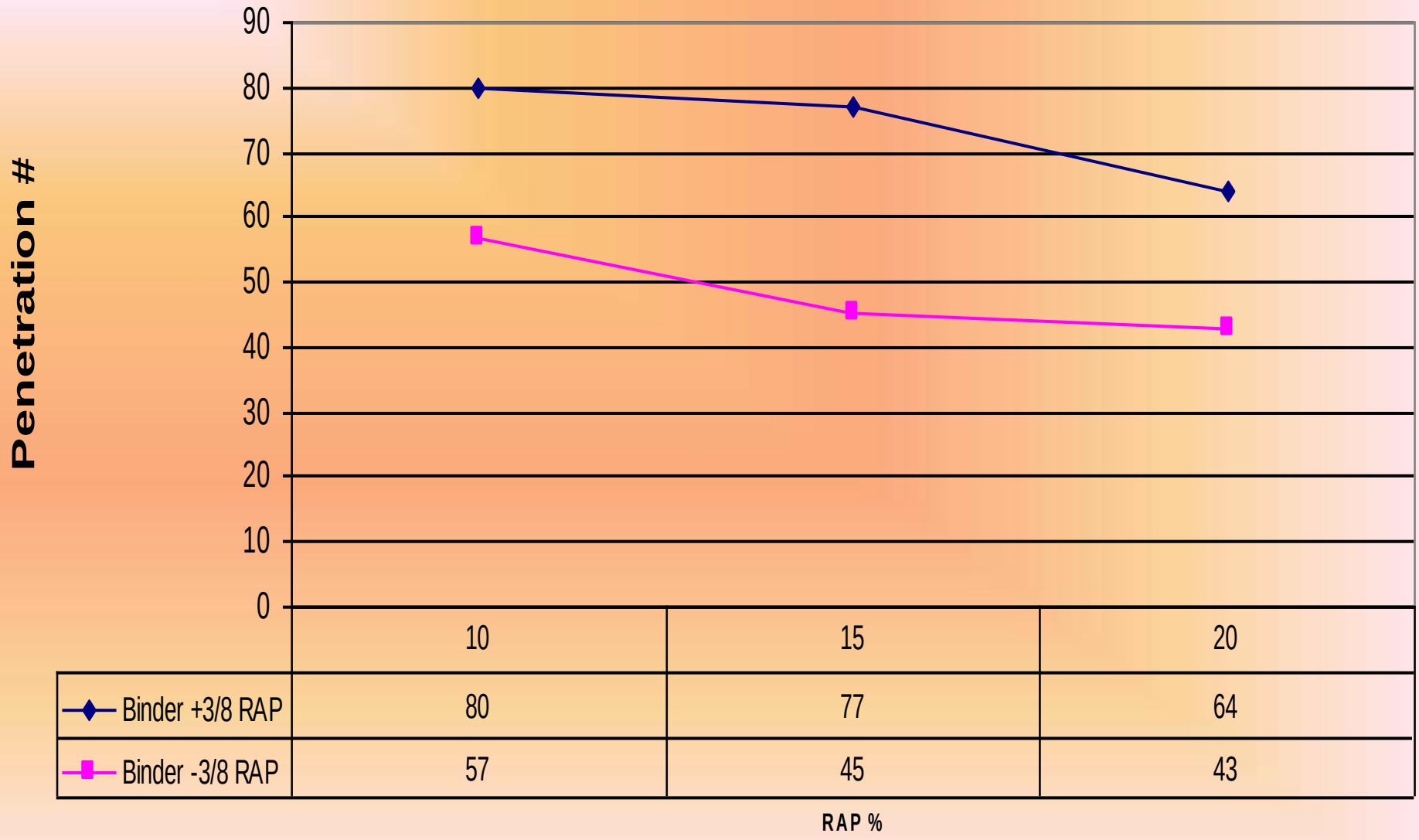
AC in RAP = 5.1

Note: All the designs meet current IDOT Specification for Volumetric Parameters.

Viscosity and Penetration Vs. +3/8 RAP Content



Penetration Results Vs. RAP %



	10	15	20
Binder +3/8 RAP	80	77	64
Binder -3/8 RAP	57	45	43

EFFECT ON RECLAIMED LIQUID

% RAP	% AC	Penetration	Viscosity	Virgin AC	Rec. Liquid
10	5.0	80	245.5	4.6	0.4
15	5.0	77	235.7	4.4	0.6
20	5.0	64	291.8	4.2	0.8
30	5.0	52	1891.7	3.5	1.5

AC in RAP = 4.0

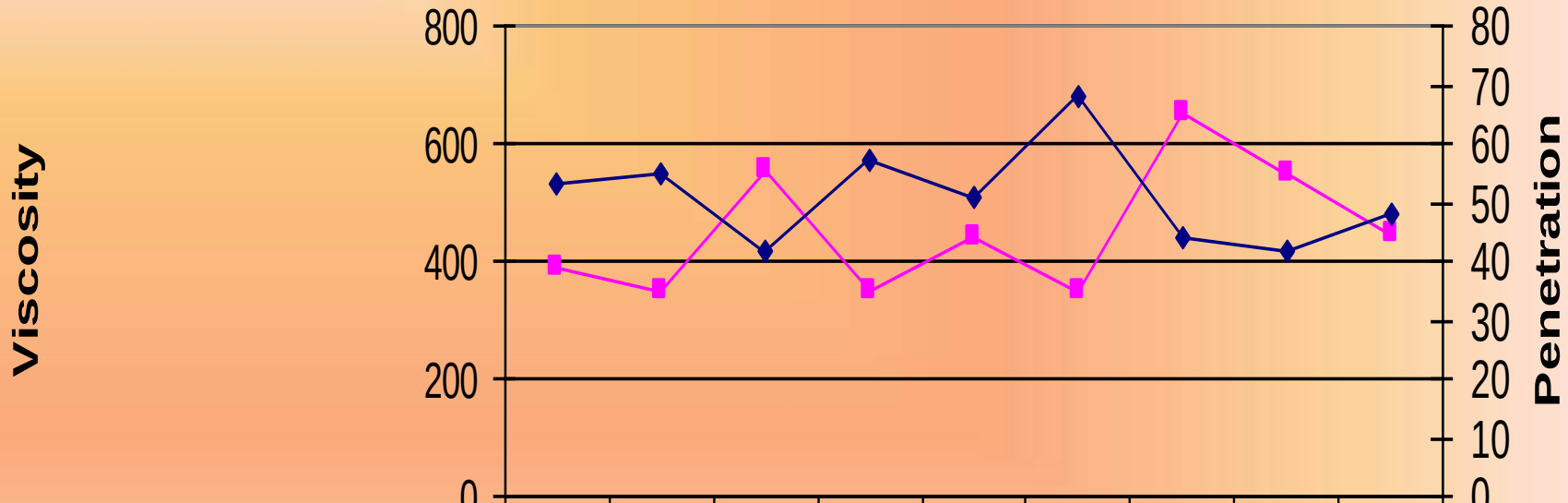
Note: All the designs meet current IDOT Specification for Volumetric Parameters.

% RAP	% AC	Penetration	Viscosity	Virgin AC	Rec Liquid
10	**5.5**	**49**	**396.3**	**5.0**	**0.5**
15	**5.5**	**53**	**390.2**	**4.8**	**0.75**
25	**5.5**	**51**	**440.0**	**4.25**	**1.25**
30	**5.5**	**48**	**448.1**	**4.0**	**1.5**

% Change Pen #	**% Change Visc.**
-3.8%	**12.8%**
-5.9%	**1.8%**

Note: All the designs meet current IDOT Specification for Volumetric Parameters.

Viscosity and Penetration Vs. RAP %
Surface Course N70



	15	15	25	25	25	25	30	30	30
5.5% AC Viscosity	390.2	351	552.1	346.9	440	348	653.5	547.2	448.1
5.5% AC Penetration#	53	55	42	57	51	68	44	42	48

% RAP