ATT-16/95, PRODUCTION RATE AND PLANT CHECK, Part IV, Drum Mix Recycling Asphalt Plants

1.0 SCOPE

This method describes the procedures for verifying the calibration of drum mix asphalt plants and for determining the test series and daily totalizer asphalt contents during the production of recycled asphalt concrete pavement (RACP).

2.0 EQUIPMENT

calculator
plant log book
stopwatch

Data Sheets: Recycling Drum Plant Inspection (MAT 6-66)
Recycle Daily Totalizer Asphalt Content (MAT 6-76)

3.0 PROCEDURE

3.1 Drum Plant Inspection

When performing the following checks, the production rate must be constant. The checks must be done before the test series plant mix sample is obtained. All data is recorded on the data sheet (MAT 6-66), which also serves as a report form.

Figure 1 shows an example of a completed form for a centre feed drum mix plant. Perform the drum plant inspection test as follows:

1. Complete the headings on the data sheet.

2. Note and record the relative density dial setting (line "B"), the virgin aggregate totalizer span setting and zero setting (line "D"), the reclaim totalizer span setting and zero setting (line "E"), the revolution or flow counter calibration factor (line "F") and the temperature of asphalt in the storage tank (line "C").

3. Note and record the virgin aggregate moisture content dial setting (line "K"), the reclaim moisture content dial setting (line "R"), the reclaim asphalt content dial setting (line "W") and the asphalt content dial setting of the recycled mix (line "ll").

   The data obtained in steps 2 and 3 should agree with previous data if no changes have been made to the settings.

4. Simultaneously perform the following:

   a) start the stopwatch,

   b) take an initial virgin aggregate totalizer tonnes counter reading and record it in line "I", and

   c) take an initial reclaim totalizer tonnes counter reading and record it in line "P".

5. Note and record the production rate meter readings in the t/h of the virgin dry aggregate (line "M"), of the dry reclaim (line "T") and of the virgin asphalt (line "EE").

6. When the virgin aggregate totalizer tonnes counter has counted a minimum of 10 tonnes, simultaneously perform the following:

   a) stop the stopwatch,

   b) take a final virgin aggregate totalizer tonnes counter reading and record it in line "H", and

   c) take the final reclaim totalizer tonnes counter reading and record it in line "O".

7. Convert the elapsed time to seconds and record it in line "G".

8. Simultaneously perform the following:

   a) start the stopwatch, and

   b) take an initial reading on the flow meter or revolution counter and record it in line "BB".

   NOTE: If the revolution or flow meter counter is in the control booth, steps 8 and 9 may be done simultaneously with steps 4 and 6 respectively.

9. When the elapsed time is approximately the same as for the aggregate totalizer, simultaneously:

   a) stop the stopwatch, and

   b) take a final reading on the flow meter or revolution counter, and record it on line "AA".

10. Convert the elapsed time to seconds and record it on line "Z".

3.1.1 Virgin Aggregate Totalizer System

1. Subtract the initial virgin aggregate totalizer reading (line "I") from the final reading (line "H") and record the count in line "J".

2. If the plant virgin aggregate totalizer displays wet aggregate, calculate the Virgin Dry Aggregate Totalizer Count in tonnes (line "L") as follows:

$$\frac{\textit{Virgin Wet Aggregate Totalizer Count (line "J")}}{100\ \%\ \textit{Agg. Moisture Content Dial Setting (line "K")}} \times 100\%$$

   If the virgin aggregate totalizer displays dry aggregate, transfer the count recorded in line "J" to line "L".

3. Calculate the "Actual" Virgin Dry Aggregate Production Rate in t/h (line "N") using the formula:

$$\frac{\textit{Dry Aggregate Totalizer Count (line "L")}}{\textit{Elasped Time in seconds (line "G")}} \times 3600\ s/h$$

4. Compare the Actual Virgin Dry Aggregate Production Rate (line "N") to the Meter Reading (line "M"). The actual value should be within ± 1% of the meter reading.

3.1.2 Reclaim Totalizer System

1. Subtract the initial reclaim totalizer reading (line "P") from the final reading (line "O") and record the count in line "Q".

2. If the plant reclaim totalizer displays wet reclaim, calculate the Dry Reclaim Totalizer Count in tonnes (line "S") as follows:

$$\frac{\textit{Reclaim Totalizer Count (line "Q")}}{100\ \%\ \textit{Reclaim Moisture Content Dial Setting (line "R")}} \times 100\%$$

   If the Reclaim totalizer displays dry reclaim, transfer the count recorded in line "Q" to line "S".

3. Calculate the "Actual" dry reclaim production rate in t/h (line "U") using the formula:

$$\frac{\textit{Dry Reclaim Totalizer Count (line "S")}}{\textit{Elapsed Time in seconds (line "G")}} \times 3600\ s/h$$

4. Calculate the Reclaim/Virgin ratio (percent of reclaim, line "V") using the formula:

$$\frac{\textit{Dry Reclaim Totalizer Count (line "S")}}{\textit{Dry Reclaim Totalizer Count \% Dry Virgin Agg. Totalizer Count}} \times 100\%$$

5. Calculate the Reclaim dry aggregate production rate in t/h (line "X") using the formula:

$$\frac{\text{Actual Dry Relaim Production Rate (line "U")}}{100\ \%\ \text{Reclaim Ashalt Content Dial Setting (line "W")}} \times 100\%$$

6. Calculate the Reclaim asphalt production rate in t/h (line "Y") using the formula:

$$\text{Dry Reclaim Prod. Rate (line "U") \& Reclaim Dry Agg. Prod.Rate (line "X")}$$

3.1.3 Asphalt Totalizer System

1. Obtain from the plant calibration data the weight in kg of asphalt delivered per revolution of pump or the weight in kg of asphalt per unit volume (as measured by the flow meter) and record it in line "A".

2. Subtract the initial reading on the flow meter or revolution counter (line "BB") from the final reading (line "AA") and record as Count (line "CC").

3. Calculate the weight in tonnes of asphalt pumped (line "DD") using one of the following formulas:

$$\frac{\text{Number of Revs (line "CC")} \times \text{Wt. of Asphalt per Rev (line "A")}}{1000\ kg/t} \quad \textit{or}$$

$$\frac{\text{Flow Meter Count (line "CC")} \times \text{Wt. of Asphalt per Unit Volume (line "A")}}{1000\ kg/t}$$

4. Determine the "Actual" asphalt production rate in t/h (line "FF") using the formula:

$$\frac{\text{Wt. of Asphalt (line "DD")}}{\text{Elapsed Time in seconds (line "Z")}} \times 3600\ s/h$$

5. Compare the Actual Asphalt Production Rate (line "FF") to the Meter Reading (line "EE"). The actual value should be within ± 1% of the meter reading.

6. Calculate the total asphalt production rate in t/h (line "GG") by adding the Actual Virgin Asphalt Production Rate (line "FF") to the Reclaim Asphalt Production Rate (line "Y").

3.1.4 Totalizer Asphalt Content

1. Calculate the Virgin Asphalt Content (line "HH) in % using the formula:

$$\frac{\text{Actual Virgin Asphalt Production Rate (line "FF")}}{\text{Reclaim Dry Agg. Prod. Rate (line "X")} \%\ \text{Dry Agg. Prod. Rate (line "N")}} \times 100\%$$

2. Calculate the Total Asphalt Content (line "KK") in % using the formula:

$$\text{'} \frac{\textit{Total Asphalt Production Rate (line "GG")}}{\textit{Reclaim Dry Agg. Prod. Rate (line "X")} \% \textit{ Dry Agg. Prod. Rate (line "N")}} \times 100\%$$

3. The Total Asphalt Content (line "KK") and the Dial Setting (line"ll")should be the same as the calibration data.

4. Use the Asphalt Content Dial Setting (line "ll") and the calibration graph of dial versus actual asphalt content to determine the percent asphalt delivered at that particular setting. Record as Actual Setting (line "JJ").

5. The test series totalizer asphalt content (line "KK") and the Actual Setting (line "JJ") must be the same. If they are not, the plant must be recalibrated.

6. The totalizer asphalt content (line "KK") should be within ± 0.3% of the design or target asphalt content.

3.1.5 Bin Proportioning System

1. Record on the lower right side of the data sheet the number assigned to the coarse bin (C), natural fines bin (NF), manufactured fines bin (MF), blend sand bin (BS), and the reclaim bin (RAP).

2. Take two or more tachometer readings on the electric motor on the feed conveyor of each bin.

3. Record the speed in rev/min of each bin on the line which corresponds to the assigned bin number (lines "LL" to "PP").

4. Plot the speed of each bin on the Aggregate and Reclaim calibration graph. Pick off the corresponding curve, the production rate in t/h of each material type.

5. Record the output of each material on the line which corresponds to the assigned bin number (lines "QQ" to "UU").

6. Calculate the total bin production rate in t/h and record it in line "VV".

7. Calculate the proportion of each bin using the formula:

$$\textit{Bin \% Split} \text{ '} \frac{\textit{Bin Production Rate}}{\textit{Total Bin Production Rate}} \times 100\%$$

Record the results in lines "WW" to "ZA".

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RECYCLING DRUM PLANT INSPECTION

PROJECT 99:08 CONTRACT NO. 6666/95 CONTRACTOR Blacktop Paving

DATE June 14, 1995 LOT NO. 2 PLANT TYPE CMI

A	WT. OF ASPHALT/REVOLUTION OF PUMP _____ kg/rev or WT. OF ASPHALT/UNIT VOLUME 0.997 kg/l, gal									
	TIME	07:45		09:30		13:00		16:15		
	TEST NO.	1		2		3		4		
PLANT SETTINGS										
B	RELATIVE DENSITY DIAL SETTING	9.42		9.42		9.42		9.42		
C	ASPHALT STORAGE AND PLANT MIX TEMPERATURES °C	148	138	147	142	148	140	149	137	
D	AGGREGATE TOTALIZER SPAN AND ZERO SETTINGS	539	578	539	578	539	578	539	578	
E	RECLAIM TOTALIZER SPAN AND ZERO SETTINGS	425	527	425	527	425	527	425	527	
F	REVOLUTION OR FLOW COUNTER CALIBRATION FACTOR	0.2187		0.2187		0.2187		0.2187		
VIRGIN AGGREGATE TOTALIZER SYSTEM										
G	ELAPSED TIME s	375		377		373		376		
AGGREGATE TOTALIZER	H FINAL READING t	7299.7		7611.8		8234.2		8813.5		
	I INITIAL READING t	7280.1		7591.5		8214.3		8793.0		DAILY AVERAGE
	J COUNT H - I t	19.7		20.3		19.9		20.5		
K	AGGREGATE MOISTURE CONTENT DIAL SETTING %	4.1		4.1		4.1		4.1		4.1
L	DRY AGGREGATE TOTALIZER COUNT 100 J / (100 + K) t	18.92		19.50		19.12		19.69		
DRY AGGREGATE PRODUCTION RATE	M METER READING t/h	183		185		186		188		185.5
	N ACTUAL 3600 L / G t/h	181.63		186.21		184.54		188.55		185.2
RECLAIM TOTALIZER SYSTEM										
RECLAIM TOTALIZER	O FINAL READING t	1311.0		1388.0		1542.0		1685.0		
	P INITIAL READING t	1306.0		1383.0		1537.0		1680.0		
	Q COUNT O - P t	5.0		5.0		5.0		5.0		
R	RECLAIM MOISTURE CONTENT DIAL SETTING %	3.2		3.2		3.2		3.2		3.2
S	DRY RECLAIM TOTALIZER COUNT 100 Q / (100 + R) t	4.84		4.84		4.84		4.84		
DRY RECLAIM PRODUCTION RATE	T METER READING t/h	47		46		47		46		46.5
	U ACTUAL 3600 S / G t/h	46.46		46.22		46.71		46.34		46.4
V	R/V RATIO (PERCENT RECLAIM) 100 S / (L+ S) %	20.4		19.9		20.2		19.7		
W	RECLAIM ASPHALT CONTENT DIAL SETTING %	5.8		5.8		5.8		5.8		5.8
X	RECLAIM DRY AGG. PROD. RATE 100 U / (100 + W) t/h	43.91		43.69		44.15		43.80		43.9
Y	RECLAIM ASPHALT PRODUCTION RATE U - X t/h	2.55		2.53		2.56		2.54		2.54
ASPHALT TOTALIZER SYSTEM										
Z	ELAPSED TIME s	375		377		373		376		
REVOLUTION OR FLOW METER	AA FINAL READING rev, l, gal	11 856		27 082		57 471		85 711		
	BB INITIAL READING rev, l, gal	10 893		26 092		56 489		84 715		
	CC COUNT AA - BB rev, l, gal	963		990		982		996		
DD	WT. OF ASPHALT PUMPED CC.A / 1000 t	0.960		0.987		0.979		0.993		
VIRGIN ASPHALT PRODUCTION RATE	EE METER READING t/h	9.2		9.3		9.4		9.4		9.3
	FF ACTUAL 3600 DD / Z t/h	9.22		9.43		9.45		9.51		9.40
GG	TOTAL ASPHALT PRODUCTION RATE Y + FF t/h	11.77		11.96		12.01		12.05		11.95
ASPHALT CONTENT	HH VIRGIN 100 FF / (N + X) %	4.09		4.10		4.13		4.09		4.10
	II DIAL SETTING %	5.2		5.2		5.2		5.2		5.2
	JJ ACTUAL SETTING (CAL. GRAPH) %	5.2		5.2		5.2		5.2		5.2
	KK TOTAL 100 GG / (N + X) %	5.22		5.20		5.25		5.19		5.22
AGGREGATE AND RAP BIN PROPORTIONING SYSTEM										
BIN MOTOR SPEED (TACHOMETER READING)	LL BIN NUMBER 1 rev/min	2230		2300		2260		2270		
	MM BIN NUMBER 2 rev/min	690		710		700		670		
	NN BIN NUMBER 3 rev/min	570		580		540		630		
	OO BIN NUMBER 4 rev/min	400		430		440		470		
	PP BIN NUMBER 5 rev/min	720		730		750		760		
DRY AGGREGATE AND RAP PRODUCTION RATE (CALIBRATION GRAPH)	QQ BIN NUMBER 1 t/h	123		127		125		125		
	RR BIN NUMBER 2 t/h	30		31		30		29		
	SS BIN NUMBER 3 t/h	19		19		18		21		
	TT BIN NUMBER 4 t/h	11		12		12		13		
	UU BIN NUMBER 5 t/h	46		46		48		48		
VV	TOTAL BIN PROD. RATE QQ + RR + SS +TT + UU t/h	229		235		233		236		
PERCENT SPLIT	WW BIN NUMBER 1 100 QQ / VV %	53.7		54.0		53.6		53.0		
	XX BIN NUMBER 2 100 RR / VV %	13.1		13.2		12.9		12.3		
	YY BIN NUMBER 3 100 SS / VV %	8.3		8.1		7.7		8.9		
	ZZ BIN NUMBER 4 100 TT / VV %	4.8		5.1		5.2		5.5		
	ZA BIN NUMBER 5 100 UU / VV %	20.1		19.6		20.6		20.3		

Material Type	Bin No.
Crush Coarse	1
Natural Fines	3
Manufactured Fines	2
Blend Sand	4
RAP	5

DAILY AVERAGE	DESIGN OR TARGET
53.6	54
12.9	13
8.2	8
5.2	5
20.1	20

MAT6-66/95

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FIGURE 1

3.2 Daily Totalizer Asphalt Content

1. Before the asphalt plant starts producing for the day, take an initial totalizer tonnes counter reading of the virgin aggregate and of the reclaim, and an initial flow meter or revolution counter reading. Record the readings in MAT 6-76 form, in lines "C", "H" and "Q", respectively, as shown in column 1 of Figure 2.

2. When the plant shuts down for the day, take a final totalizer tonnes counter reading of the virgin aggregate and of the reclaim, and a final flow meter or revolution counter reading. Record the readings in lines "B", "G", and "P" respectively.

   Ensure the weight of reclaim cleaned out of the bin is not included in the reclaim totalizer reading.

   The final reading of one day is the initial reading of the next day.

3. Subtract the original from the final readings and record the Virgin Aggregate Totalizer Count (line "D"), the Reclaim Totalizer Count (line "I") and the number of Revolutions or Flow Meter Count (line "R").

4. Obtain from the Recycling Drum Plan Inspection form (MAT 6-66), the daily average moisture content dial setting of the virgin aggregate (line "E") and reclaim (line "J") and the daily average reclaim asphalt content dial setting (line "M").

5. If the plant virgin aggregate totalizer displays wet aggregate, calculate the Virgin Dry Aggregate Totalizer Count in tonnes (line "F") as follows:

$$\text{,} \quad \frac{\textit{Virgin Wet Aggregate Totalizer Count (line "D")}}{100\ \%\ \textit{Agg. Moisture Content Dial Setting (line "E")}} \times 100\%$$

   If the virgin aggregate totalizer displays dry aggregate, transfer the count recorded in line "D" to line "F".

6. If the plant reclaim totalizer displays wet reclaim, calculate the Dry Reclaim Totalizer Count in tonnes (line "K") as follows:

$$\text{,} \quad \frac{\textit{Reclaim Totalizer Count (line "I")}}{100\ \%\ \textit{Reclaim Moisture Content Dial Setting (line "J")}} \times 100\%$$

   If the Reclaim totalizer displays dry reclaim, transfer the count recorded in line "I" to line "K".

7. Calculate the Reclaim/Virgin ratio (percent of reclaim, (line "L") using the formula:

$$\text{,} \quad \frac{\textit{Dry Reclaim Totalizer Count (line "K")}}{\textit{Dry Reclaim Totalizer Count \% Dry Virgin Agg. Totalizer Count (line "F")}} \times 100\%$$

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RECYCLE DAILY TOTALIZER ASPHALT CONTENT

PROJECT 99:08 CONTRACT NO. 6666/95

CONTRACTOR. Blacktop Paving PLANT TYPE CMI

	DATE		95.06.14	95.06.14	95.06.14	95.06.14	95.06.14	95.06.14
	LOT NO.		2	start to 1	test 1-2	test 2-3	test 3-4	4 to end
A	WT. OF ASPHALT/REVOLUTION OF PUMP _____ kg/rev or WT. OF ASPHALT/UNIT VOLUME 0.997 kg/ℓ, gal							

VIRGIN AGGREGATE TOTALIZER SYSTEM

AGGREGATE TOTALIZER	B	FINAL READING		t	9279.8	7280.1	7591.5	8214.3	8793.0	9279.8
	C	INITIAL READING		t	7146.5	7146.5	7299.7	7611.8	8234.2	8813.5
	D	COUNT	B - C	t	2133.3	133.6	291.8	602.5	558.8	466.3
E	AGGREGATE MOISTURE CONTENT DIAL SETTING			%	4.1	4.1	4.1	4.1	4.1	4.1
F	DRY AGGREGATE TOTALIZER COUNT		100 D / (100 + E)	t	2049.28	128.34	280.31	578.77	536.79	447.93

RECLAIM TOTALIZER SYSTEM

RECLAIM TOTALIZER	G	FINAL READING		t	1804.1	1306.0	1383.0	1537.0	1680.0	1804.1
	H	INITIAL READING		t	1273.0	1273.0	1311.0	1588.0	1542.0	1685.0
	I	COUNT	G - H	t	531.1	33.0	72	149.0	138.0	119.1
J	RECLAIM MOISTURE CONTENT DIAL SETTING			%	3.2	3.2	3.2	3.2	3.2	3.2
K	DRY RECLAIM TOTALIZER COUNT		100 I / (100 + J)	t	514.63	31.98	69.77	144.38	133.72	115.41
L	R/V RATIO (PERCENT RECLAIM)		100 K / (F + K)	%	20.1	19.9	19.9	20.0	19.9	20.5
M	RECLAIM ASPHALT CONTENT DIAL SETTING			%	5.8	5.8	5.8	5.8	5.8	5.8
N	WT. OF DRY AGGREGATE IN RECLAIM		100 K / (100 + M)	t	486.42	30.23	65.95	136.47	126.39	109.08
O	WT. OF ASPHALT IN RECLAIM		K - N	t	28.21	1.75	3.82	7.91	7.33	6.33

ASPHALT TOTALIZER SYSTEM

REVOLUTION OR FLOW METER	P	FINAL READING		rev, l, gal	108 602	10 893	26 092	56 489	84 715	108 602
	Q	INITIAL READING		rev, l, gal	4 379	4 379	11 856	27 082	57 471	85 711
	R	COUNT	P - Q	rev, l, gal	104 223	6 514	14 236	29 407	27 244	22 891
S	WT. OF ASPHALT PUMPED		R . A / 1000	t	103.91	6.49	14.19	29.32	27.16	22.82
T	TOTAL WT. OF ASPHALT		S + O	t	132.12	8.24	18.01	37.23	34.49	29.15
U	TOTAL WT. OF DRY AGGREGATE		N + F	t	2535.70	158.57	346.26	715.24	663.18	557.01
ASPHALT CONTENT	V	VIRGIN	100 S / U	%	4.10	4.09	4.10	4.10	4.10	4.10
	W	TOTAL	100 T / U	%	5.21	5.20	5.20	5.21	5.20	5.23

BELT SCALE ERROR

X	TRUCK SCALE TOTAL WT. OF MOIST RECYCLED MIX			t	2 683.1					
Y	AVERAGE MOISTURE CONTENT OF RECYCLE			%	0.21					
Z	TRUCK SCALE DRY WT. OF RECYCLE		100 X / (100 + Y)	t	2 677.5					
AA	TOTALIZER DRY WT. OF RECYCLE		F + K + S	t	2 667.8					
BB	BELT SCALE ERROR		100 (Z - AA) / Z	%	0.36					

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REMARKS _____

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FIGURE 2

8. Calculate the weight in tonnes of dry aggregate in the reclaim (line "N") using the formula:

$$\text{'} \frac{\textit{Dry Reclaim Totalizer Count (line "K")}}{100\ \%\ \textit{Reclaim Asphalt Content Dial Setting (line "M")}} \times 100\%$$

9. Calculate the Weight of Asphalt in the reclaim in t (line "O") as follows:

' *Dry Reclaim Totalizer Count* (*line* "*K*") & *Reclaim Dry Agg*. *Wt*. (*line* "*N*")

10. Obtain from the plant calibration data, the weight in kg of asphalt delivered per revolution of pump or the weight in kg of asphalt per unit volume as measured by the flow meter, and record it in line "A".

11. Calculate the weight in tonnes of asphalt pumped during the day (line "S") using the applicable formula:

$$\text{'} \frac{\textit{No. of Revolutions (line "R")} \times \textit{Wt. of Asphalt per Revolution (line "A")}}{1000\ kg/t} \quad \textit{or}$$

$$\text{'} \frac{\textit{Flow Meter Count (line "R")} \times \textit{Wt. of Asphalt per Unit Volume (line "A")}}{1000\ kg/t}$$

12. Calculate the Total Wt. of Asphalt (line "T") using the formula:

' *Wt*. *of Asphalt Pumped* (*line* "*S*") % *Wt*. *of Asphalt in Reclaim* (*line* "*O*")

13. Calculate the Total Wt. of Dry Aggregate in t (line "U") using the formula:

' *Dry Agg*. *Totalizer Count* (*line* "*F*") % *Wt*. *of Dry Agg*. *in Reclaim* (*line* "*N*")

14. Determine the Virgin Asphalt Content in % (line "V") as follows:

$$\text{'} \frac{\textit{Wt. of Asphalt Pumped (line "S")}}{\textit{Total Wt. of Dry Aggregate (line "U")}} \times 100\%$$

15. Calculate the Total Asphalt Content in % (line "W") as follows:

$$\text{'} \frac{\textit{Total Wt. of Asphalt (line "T")}}{\textit{Total Wt. of Dry Aggregate (line "U")}} \times 100\%$$

3.3 Belt Scale Error

1. At the end of the production day, obtain from the scale person, the weight in kg of all loads of recycled mix rejected or diverted during that day.

   Ensure the loads rejected at the plant which did not pass over the scales, are added to the mix produced. Occasionally the contractor may be asked to divert loads of mix to another project, i.e., patching. Since these loads are typically recorded on separate scale sheets, ensure that you account for all recycled mix produced by the asphalt plant during the day.

2. Obtain from the office person, the total weight in kg of moist recycled mix produced during the day, as shown in the scale sheet.

3. Calculate the total weight of moist recycled mix in tonnes produced by the plant during the day (line "X") as follows:

$$X = \frac{\text{Scale Sheet Wt. of Mix} - \text{Rejected or Diverted Wt. of Mix}}{1000\ kg/t}$$

4. Determine the average oven moisture content of the recycled mix in percent (line "Y").

5. Calculate the Truck Scale Dry Weight of Recycled Mix in t (line "Z") using the formula:

$$Z = \frac{\text{Total Wt. of Moist Recycled Mix (line "X")}}{100 - \text{Mix Moisture Content in \% (line "Y")}} \times 100\%$$

6. Calculate the total dry weight of recycled mix given by the totalizers (line "AA") as follows:

$$AA = \text{Dry Agg. Totalizer Count} - \text{Dry Reclaim Totalizer Count} - \text{Wt. of Asphalt Pumped}$$

7. Calculate the percent difference between the totalizer dry weight of recycle (line "AA") and the truck scale dry weight of recycle (line "Z") using the formula:

$$\text{Belt Scale Error (\%)} = \frac{\text{Truck Scale Wt. of Recycle} - \text{Totalizer Wt. of Recycle}}{\text{Truck Scale Wt. of Recycle}} \times 100\%$$

3.4 Asphalt Content Between Tests

In the virgin aggregate totalizer, reclaim totalizer and the revolution counter or flow meter were timed simultaneously, the totalizer asphalt content can be determined between drum plant inspection tests as follows:

1. Obtain from the Recycling Drum plan Inspection data sheet the test series final reading on the aggregate totalizer (line "H"), on the reclaim totalizer (line "O") and on the revolution counter or flow meter (line "AA").

   For the check between the start of the day's production and the day's first test series, use the final readings of the previous day (the initial readings of the day). Record as Initial Readings on MAT 6-76 on lines "C", "H" and "Q" respectively, as shown in Figure 2.

2. Obtain from the data sheet the following test series initial readings on the aggregate totalizer (line "I"), on the reclaim totalizer (line "P") and on the revolution counter or flow meter (line "BB").

Record as Final Readings on MAT 6-76 on lines "B", "G" and "P" respectively. Use the final readings of the day for the check between the day's last test series and the end of the day's production.

3. Obtain from MAT 6-66 the moisture content dial setting of the virgin aggregate (line "K") and of the reclaim (line "J") and the reclaim asphalt content dial setting (line "M") and transfer the values to MAT 6-76, lines "E", "J" and "M" respectively.

4. Subtract the test series final readings from the following test series initial readings (or final readings of the day, if performing the last check of the day).

5. Record the aggregate totalizer count between test series (line "D"), the reclaim totalizer count (line "I") and the number of revolutions or flow meter count (line "R").

6. Complete the calculations as described in steps 5 to 15 of Section 3.2

4.0 HINTS AND PRECAUTIONS

1. The belt scale must be warmed up for half hour before any tests.

2. If settlement or movement of a belt scale conveyor occurs, recalibrate the belt scale as directed in ATT-17, until it reads accurately.

3. Each belt scale must be checked with known amount of test weights. This determines if the load cell signal is the same as when it was calibrated and if the totalizer is working properly. However, the test does not necessarily indicate that the belt scale is accurate.

4. Make sure that the aggregate and reclaim percent moisture and relative density dials are set correctly.