# Appendix 8–2

## SOIL BORING LOG RECORDS

Sheet No. 1 of 8

#### BORING LOG RECORD

Location : _Jct. ALFONSO to MAGALLANES									
Road Classification :       Provincial       Experimental Pavement Section No. 1       Boring No. 1         Date:       November 27, 1989       Water Table:       Did not noticed									
Date: Novem	ber 2	27, 1989		Water Table : Did not noticed					
	No. *	Depth from	c Chart	VISUAL IDENTIFICATION OF SOIL	DEMARKO				
Example Sand , S Clay	Sample	surfoce in Cm.	Symbolic	(Indicate color and texture of soil)	REMARKS				
<u>الم</u>		5	10,00	Brown gravelly silty sand	Gravel surface				
T Soulders Rock Fragments		10							
-									
С Н А R		40 		Brown sendy silt	. Subgrode				
0 <u>0 0</u>		40							
A B O L and ubgrade	1	50			-				
S Y M B Sand Subg		60							
		70 50		Gray brown silty sand					
		80							
E G E N		90							
		100		End of Auger					
		110							
0196 Soll		120							
		130							

Submitted by :

(Soil Engineer)

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Sheet No. 2 of 8

## BORING LOG RECORD

Loc	Location :Jct. ALFONSO to MAGALLANES								
		Boring No. 2							
Date	e: <u>November</u>	27	, 1989		Water Table :Did not noticed				
E xam ple	Sand , Sitt	Sample No. *	Depth from surfac in Cm.		VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS			
ω	<u>α</u> δ	Š		الم سيا سي					
	Boulders Rock Fragments		_10	25	Gray brown gravel sand and cobbles	Gravel surface			
RТ			20	000					
СНА	50000 50000 6ravel mple		30						
	S S S		40						
N B O L	Subgrade		50		Brown clayey silt	Subgrade			
l ⊁ s	°		<u>eo</u>	5					
0 8	N_	2	70						
<b>ધ</b> ـ	SI		80						
ы И Ш			90						
ں ب	CIO		100		Dark brown silty clay				
					End of Auger				
	×× v 0 × v E		110						
	0rgan Soll		120						
			130						

Submitted by :

<sup>(</sup>Soil Engineer)

Sheet No. 3 of 8

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#### BORING LOG RECORD

Location : \_\_\_\_\_\_ ALFONSO to MAGALLANES

 Road Classification :
 Provincial
 Experimental Pavement Section No. 1
 Boring No. 3

 Date :
 November 27, 1989
 Water Table :
 Did not noticed

Example	Sand , Silt Clay	Sample No. <b>*</b>	Depth from surface in	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
Ш Х	Sa	Sal	Cm.	- k	(Indicate color and texture of soil)	
			5	10-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	Silty gravel and sand	Gravel surface
	Boulders Rock Fragments		10			
۲	Rock B		_20			
НАК	0000 0000 vel		30			
υ	000000 00000 Gravel Sample		40 70		Brown silty sand	Subgrade
רי ס פ	rade		50			
N ≻ S	Sand Subg	3	_60			
с К	N 13		70			
Ē	sil s	,				
۵·	لخا		80			
22 Ш О			<u>90</u>		<u>Wet</u> , Brown sand silt and clay	
ບ ພ ພ	Clay		100			
	<b>***</b>					
	¢ <sup>¢</sup>					
			130			

Submitted by 1

Sheet No. 4 of 8

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## BORING LOG RECORD

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Locotion :Jct. ALFONSO to MAGALLANES							
				Experimental Pavement Section No1_	_Boring No4		
Date: <u>Novemb</u>	er 2	7,1989		Water Table :Did not noticed	**********		
imple sitt Clay	e No. *	Depth from surface	lic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS		
Example Sand , S Clay	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)			
T Soulders Rock Fragments		<u>10</u> 20	° • 0 • 0 •	Gray gravelly sand with some cobbles and boulders	Gravel surface		
H A R							
a Colored Colo		40	XXX				
S Y M B Sand		60	HHH	Brown silty clay	Subgrade		
E O R		70					
لنحكا		80 X	$\left \right\rangle$				
G E N D		_90_20		Light brown and wet silty clay			
G G C C C C C C C C C C C C C C C C C C		100					
V~y V		110		End of Auger			
Organ Soll		120					
		130			<u> </u>		

Submitted by 🗧

(Soil Engineer)

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Sheet No. 5 of 8

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#### BORING LOG RECORD

Location :	Location :Jct. ALFONSO to MAGALLANES								
					Experimental Pavement Section No. 1	Boring No. 5			
Date: <u>Novembe</u>	r 27,	1989			Water Table : Did not noticed				
Example Sand , Silt Clay	Sample No. <b>*</b>	Dept fror surfc in Cm	n Jce	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS			
T Soulders Rock Fragments		10	15	0.0 0.0 0.0 0.0 0.0	Gray gravel and sand with some cobbles	Gravel surface			
~		<u>20</u> 30							
0000 0000 0000 0000 0000 0000 0000 0000 0000				Brown sandy clay silt	Subgrade				
Y M B O L Sand Subgrade		50	<u> </u>						
» لينا « []	5	<u>60</u>  70		50		Brown silty sand			
		80							
		90							
		100							
organic Soll		120							
	L	130							

Submitted by 1

(Soil Engineer)

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Sheet No. 6 of 8

### BORING LOG RECORD

Location :Jct. ALFONSO to MAGALLANES									
				Experimental Pavement Section No	Boring No. 6				
Date: Novembe	ər 27	7, 1989	······································	Water Table : Did not noticed	:				
Example Example Sand , Silt Clay	Sample No. *	Depth from surface in Cm.	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS				
T Soulders Rock Fragments		10 20		Gray gravel and sand with some cobbles	Gravel surface				
LEGEND FOR SYMBOL CHART LEGEND FOR SYMBOL CHART C.1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	6	20 30 40 50 85 70 80 90 100 110 120		Dark clayey silt	Subgrade				
		130							

Submitted by 1

(Soil Engineer)

Sheet No. 7 of 8

### BORING LOG RECORD

Location :	Location :Jct. ALFONSO to MAGALLANES								
Road Classifica	tion	: Provinci	al	Experimental Pavement Section No1	Boring No				
Date: <u>Novembe</u>	r 27	, 1989		Water Table : Did not noticed					
Example Sand , Silt Clay	Sample No. *	Depth from surface in Cm.	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS				
T Soulders Rock Fragments		10 10	6 0 0 0 0 0 0 0 0 0 0 0	Gray gravel and sand with some cobbles	Gravel surface				
ĩ		50							
С Н А F 550°000 550°000 6ravel mple		30 35		Gray clayey silt	Subgrade				
S S		40							
SYMBOL Sand Subgrade	7	<u>50</u> 60							
« []		70							
S S S S S S S S S S S S S S S S S S S		60 		Dark brown clayey silt					
		90							
		100		<u> </u>					
Soil Soil		110		L- End of Auger					
		120 130							

Submitted by 🗧

Sheet No. 8 of 8

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## BORING LOG RECORD

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Location :	Location : Jct. ALFONSO to MAGALLANES								
			ial	Experimental Pavement Section No1	Boring No. 8				
Date: <u>Novembe</u>	r 27	1989		Water Table: Did not noticed					
Example Sand , Silt Clay	Sample No. *	Depth from surface in Cm.	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS				
ica f		4:5-¥	000 000	Gray gravel and sand with cobbles	Gravel surface				
T Soulders Rock Fragments		10 		Gray clayey silt	Subgrade				
С Н А R 50,000 60,000 610 vel		<u>30 x</u>							
N N N	8	_40	HH.	•					
Y M B O L Sand Subgrade		50							
		<u>    60                                </u>		Brown yellow silt clay					
		80							
GEN		90							
S L	ļ	100 4		η					
		_110_		End of Auger					
Organ Soll		120							
	L	130							

Submitted by :

<sup>(</sup>Soil Engineer)

Sheet No. 1 of 8

## BORING LOG RECORD

	tion	: Provincia		LLANES Experimental Pavement Section No, _2 Water Table: <u>Did_not_noticed</u>	Boring No1
y III	No. <b>*</b>	Depth from surface	ic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
Example Sand, S Clay	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)	
T Source s Rock Fragments		10 17	14/6/61/18/06/	Silty gravel and sand	Gravel surface
С Н А R T		<u>30</u> 23	a de la desta d La desta de la d	Sandy silt (dark brown)	Subgrade
S Y M B O L Sand Subgrade	1	50			
F O R		<u>70</u> 65		Light brown silty clay	
E G E N D		90			
		100		End of Auger	
organ! Soil	, , ,	120			
		130			

Submitted by :

<sup>(</sup>Soil Engineer)

Sheel No. 2 of 8

### BORING LOG RECORD

Location :MARAGONDON to MAGALLANES									
					Experimental Pavement Section No. 2	_Boring No2			
Date: <u>www.mber</u>	_ <u></u> ,	1969			Water Table: <u>Did not noticed</u>				
Example Sand, Silt Clay	ple No. *	Dep froi surf in	m oce	ymbolic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS			
Exa San	Sample	Cn		Sym	(Indicate color and texture of soil)				
T Boulders Rock Fragments		10	10	0 0 0 0 0 0 0 0 0	Gravelly sand and silt with some cobbies	Gravel surface			
		20		0000					
H A R 00000000000000000000000000000000000	30		30	0.00	Yellowish brown sand, silt with some gravel	Subgrade			
С Н 00000 6ravel Sample		40		0 0 0 0					
M B O L Sand Subgrade		50							
° S ⊡°s s	2	2 <u>60</u>							
		70	60		Dark gray silty sand				
s s		80							
		90							
LEG		100	¥		<u>-</u>				
××× <u>0</u>		110	-		End of Auger				
01gan Soll		120							
		130							

Submitted by 1

Sheet No. 3 of 8

## BORING LOG RECORD

Location :M	ARAG	ONDON to MA	GALL	ANES	
	_Boring No3				
Date: <u>Novembe</u>	r 25	, 1989		Water Table: Did not noticed	
imple	le No. ¥	Depth from surface	olic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
Example Sand , Si Clay	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)	
			8 00 8		
T Soulders Rock Fragments		20	10,0, 0 0,0,0,00	Brown gravel sand and some slit	Gravel surface
~			1111		
C H A F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		<u>30</u> 25 40		Sandy silt (grayish brown)	Subgrade
M B Sand Subgi	3	50			
5 🖾 M		_60			•
" "		70			
н SI		_ <u>80</u>		Silty clay (yellowish brown) with some sand	
		90			
		100		· · · · · · · · · · · · · · · · · · ·	
··· · · · ·		110		End of Auger	
د د د د د د د د Soil		120			
······································		130			

Submitted by 1

<sup>(</sup>Soil ingineer)

Sheet No. 4 of 8

BORING	LOG	RECORD	

Loca	Location :MARAGONDON to MAGALLANES									
Road					Experimental Pavement Section No2	_Boring No4				
Date	e: Novembe	r 25	5, 1989		Water Table : Did not noticed					
ple	d , Silt	le No. <del>X</del>	Depth from surface	olic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS				
Example	Sand	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)					
	Boulders Rock Fragments		10 20	19/6/10/10	Gravel sond with silt	Gravel surface				
-1	ŭ č		20	00						
CHAR	<u>୦ ଟ ୦୦ ୦୦</u> ୦ ୦୦୦୦୦୦୦ Gravel Sample		<u>30</u> 30 40		Light brown silt	Subgrade				
с В О Г	Sand Subgrade S		50							
W ≻ S		4	_60							
F О R			<u>70</u> 55		Grayish brown silty clay					
۵			80							
א ש ני	CIGY		90							
ш Ц	N°.		100							
	<pre>&lt;</pre>		110		- End of Auger					
	So So		120							
			130							

Submitted by 1

<sup>(</sup>Soil Engineer)

Sheet No. 5 of 8

#### BORING LOG RECORD

Location: \_\_\_\_MARAGONDON to MAGALLANES

 Road Classification : <a href="https://www.provincial">Provincial</a> Experimental Pavement Section No. 2
 Boring No. 5

 Date : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Provincial</a> Experimental Pavement Section No. 2
 Boring No. 5

 Date : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">S</a>

 Date : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com">Notematication : <a href="https://www.notematication.com"/>https://www.notematication.com"/>https://www.notematication.com</a>

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	No. *	Depth from	Chart	VISUAL IDENTIFICATION OF SOIL	
Example Sand , Silt Clay	Sample 1	surface in Cm.	Symbolic	(Indicate color and texture of soil)	REMARKS
T Eoulders Rock Fragments			0) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	Gravel sand and silt with some cobbles	Gravel surface
		_20			
H A R 00000 Vei		30			
M B O L C H A O C O O O O O O O O O O O O O O O O O O		403	0	Light brown silty sand with some cobbles	Subgrade
B O B O B O B O B D D B D D D D D D D D		50			
s Y M B Sand		60			
L C L	5	70			
SI		<u>80</u>	5	Dark brown silty clay	
G E N D		90			
		100			
YYY O		110		End of Auger	
, , , , , , , , , , , , , , , , , , , ,		120			
a statute a		130			

Submitted by :

Sheet No. 6 of 8

## BORING LOG RECORD

Location :MA	_ocation:MARAGONDONG to MAGALLANES									
				Experimental Pavement Section No2	_Boring No. <u>6</u>					
Date: <u>Novemb</u>	ег 27	, 1989		Water Table:Did not noticed	وي اين جريب الم المان الم					
opie Sitte oy	e No. *	Depth from surface	lic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS					
Example Sand , Si Clay	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)						
T Soulders Rock Fragments		10 20	8.9.9.9.9.9 8.9.9.9.9	Gravel sand and silt	Gravel surface					
н се об н се		20 X	-							
С Н А R 050,0000 00000 Gravel Sample										
S Y M B O L Sand Subgrade	6	50 60 85	LAN SAL	Dark gray silty clay	Subgrade					
SIII		_70								
Cloy		90								
K-71 -										
2 c c c c c c c c c c c c c c c c c c c		110		End of Auger						
L <u>×</u> √~		130								

Submitted by 1

<sup>(</sup>Soil Engineer)

Sheet No. 7 of 8

#### BORING LOG RECORD

Location : \_\_\_\_MARAGONDON to MAGALLANES

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 Road Classification :
 Provincial
 Experimental Pavement Section No.
 2
 Boring No.
 7

 Date :
 November 27, 1989
 Water Table :
 Did not noticed

*     Depth     E       S     from	
at the surface of soil) REMA	ARKS
Steel 10 20 Gray brown natural gravel, sand and Gravel sur cobbles	face
V Cool Cool Cool Cool Cool Cool Cool Cool	
W Boundary States	
5 60 60 A mixture of brown sand, silt and clay Subarade	
a     7     90     A mixture of brown sand, silt and clay     Subgrade       a     7     70     90     A mixture of brown sand, silt and clay     Subgrade       a     5     70     10     10     10	
V     E       V <td></td>	
130	

Submitted by :

Sheet No. 8 of 8

## BORING LOG RECORD

Location	_ocation:MARAGONDON to MAGALLANES									
						Experimental Pavement Section No2	Boring No. <u>8</u>			
Date:^	lovember	• 27,	1989			Water Table:Did_not_noticed				
ote	d , Silt Clay	e No. *	Dept from surfe	m	lic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS			
Example	Sand	Sample	in Cn		Symbolic	(Indicate color and texture of soil)				
R	Boulders Rock Fragments		10	15	0.000	Gray brown natural gravel and sand with some cobbles	Gravel surface			
K.	л С К Ш С К			<u> </u>	00					
	Ro		20							
C H A R	ivel		30							
U 600 000	Sa		40	35		Brown silty sand	Subgrade			
L 0 8	rode		50							
× ×	Sand Subg		60							
≝ []			70							
0 L	- S		80							
دی z ۲۷	2 8 8	8		65		Brown clayey silt				
в	٩Y		90		X					
	G		100							
<b>••••</b>	U		110				· ·			
** ** **	Organi Soll		120			End of Auger				
			130							

Submitted by 1

<sup>(</sup>Soil Engineer)

Sheet No. 1 of 8

#### BORING LOG RECORD

Location : GEN. TRIAS to AMADEO Road Classification : Provincial Experimental Pavement Section No. 3 Boring No. 1 \_ Water Table : \_\_\_\_ Did\_not\_noticed Date: <u>November 23, 1989</u> Chart ⋇ VISUAL IDENTIFICATION OF SOIL Depth No from Symbolic REMARKS Example Clay surface Sample in Cm. (Indicate color and texture of soil) 00 Boulders Rock Fragments 0.0 0 0 10 0.0 İ 25 Gray brown crushed gravelly sand Shouider 0 20 +-0 Q 0 œ A H 30 Grave υ Subgrade Sample 40 \_\_\_ 35 Brown silty sand with some pea gravel Subgrade o æ 50 Sand Z ≻ Ó 60 ¢ 70 ο k. 80 1 45 Brown sandy silty clay ٥ z 90 ۱u Ø ω 100 -End of Auger 110 120 130

Submitted by 1

(Soil Engineer)

8 - 2 (17)

Sheet No. 2 of 8

Location :	. TR					
					Experimental Pavement Section No3	Boring No. 2
Date: Novemb	er 2	3, 1989	9		Water Table: Did_not_noticed	
Example Sand, Sitt Clay	Sample No. *	Dep fro surf in Cri	m ace	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS
R T Boulders Rock Fragments		10 20	25	00,000,00,00,00 00,000,00,00,00 00,000,00,	Brown crushed gravely sand	Shoulder
L C H A R 0 2 0 0 0 0 0 2 0 0 0 0 Gravel le Sample		30 40	20		Brown clayey silty sand with some pea gravel	Subgrade
S Y M B O L Sand Subgrade		50 60	X			
F O R	2	70 80	- 55		Brown silty sand	
LEGEND Clay		90 100			Î	
¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢ ¢		110 120			End of Auger	
		130				

BORING LOG RECORD

Submitted by :

<sup>(</sup>Soil Engineer)

Sheet No. 3 of 8

#### BORING LOG RECORD

Location :GEN. TRIAS to AMADEO									
	_Boring No3								
Date: <u>November</u>	23,	1989	,	Water Table : <u>Did not noticed</u>					
	No. *	Depth from	c Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS				
Example Sand , S Clay	Sample	surface ìn Cm.	Symbolic	(Indicate color and texture of soll)	REMARKS				
R T Boulders Rock Fragments		<u>10</u> 30 <u>20</u>		Brown crushed gravelly sand	Shoulder				
С Н А Р <u> </u>		<u>30</u>	0000 190 9 10 9	Brown silty sand with some pea gravel	Subgrade				
M B O L Sand Subgrade		50	1 9 5 0 9 9 5 0 1		Jubgruus				
		60	× / / / / / /						
F O R	3	<u>70</u> 50		Brown silty sand					
		80 90							
		100		Ŋ					
		110		End of Auger					
019dn		120							
·	L	130							

Submitted by 1

(Soil Engineer)

8 - 2 (19)

Sheet No. 4 of 8

Location :	<u>N. T</u>	RIAS to AM	MADEO		
				Experimental Pavement Section No3	Boring No. <u>4</u>
Date: <u>Novembe</u>	r 23	, 1989		Water Table : Did not noticed	
a Silt	No. *	Depth from surface	ic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
Example Sand , S	Sample	in Cm.	Symbo	(Indicate color and texture of soil)	
t Soulders Rock Fragments		10	0.000 0000 0000 0000		
~		203		Brown gravelly sand	Shoulder
H A 00000 190		30	0.0		
80 S		<u>40</u> 2	0	Brown silty sand with some pea gravel	Subgrade
M B O L M B O L Sand Subgrade		50 ,			
s s s s		<u>60</u>			
в []-Д	4	3 	io () 	Brown sandy silt	
R SIL		80 ,			
D Z W		90	17 17	Brown sandy clayey silt	
L E G Ciay		100			
		110		A	
Organic Soli		120		End of Auger	
		130			

## BORING LOG RECORD

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Submitted by 1

Sheet No. 5 of 8

#### BORING LOG RECORD

Location : GEL T	RIAS to AM	ADEO	·	
			Experimental Pavement Section No3	Boring No. 5
Date: <u>November</u> 2	23,1989		Water Table: Did not noticed	
e No. *	Depth from surface	a lic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
Example Sand, S Clay Sumple	in Cm.	a Symbolic	(Indicate color and texture of soil)	
H Boulders Rock Fragments	10	0°0		
~	20 3	30 000	Brown crushed gravelly sand	Shoulder
H A H A	30	0.0 0.0 1	· · ·	
	40			
M B O L Sand Subgrade	50 4	0	Brown clayey silt	Subgrade
° ° ° °	60			
а 0	70	X		
L L	80		Brown silty clay	
M N N	90 	•		
	100			
V V V	110		End of Auger	
Organi Soll	120			
	130			

Submitted by 1

8 - 2 (21)

<sup>(</sup>Soil Engineer)

Sheet No. 6 of 8

## BORING LOG RECORD

Loco	ocation :GEN. TRIAS to AMADEO										
						Experimental Pavement Section No. <u>3</u>	Boring No. 6				
Date	e:Novembe	r 23	, 1989		*******	Water Table: Did not noticed					
¢		No. <b>*</b>	Dep fro	m	c Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS				
Example	Sand , SI	Sample	surf in Cn	i	Symbolic	(Indicate color and texture of soil)					
	Boulders Rock Fragments		10	22		Gray brown crushed gravelly sand	Shoulder				
я Т			20		0 0 0 0						
C H A	1200000 00000 Gravel Tiple		30								
ر.	6000 000 0000 0000 0000	6	40	38		Brown silty clay	Subgrade				
0 8 W J	Sand Gra		50								
کر د			60	X							
г О Я			70								
G			80								
л С С	No.		90	50		Yellowish brown clay	Soil very wet may be sign of water table elevation.				
μ. Γ	G		100								
	<b>**</b> *] 0		110		$\square$						
	organic Soil		120			End of Auger					
			130								

Submitted by C

Sheet No. 7 of 8

### BORING LOG RECORD

Loca	ition: <u>GEN</u>	I. TR	IAS to A	MADE	:0		
Road	l Classifica			ncial		Experimental Pavement Section No. <u>3</u>	Boring No7
Date	: Novembe	ir 23	3, 1989		······	Water Table : <u>Did not noticed</u>	
	X III X	No. *	Dept from	۱ I	c hart	VISUAL IDENTIFICATION OF SOIL	
Example	Sand . S Clay	Sample	surfa in Cm		Symbolic	(Indicate color and texture of soil)	REMARKS
	Boulders Rock Fragments		10	25	0.0 0.0 0.0 0.0 0.0		
я Т			20	20		Brown gravelly sand	Shoulder
CHA	000		30	- <b>X</b>		······································	
ں د	00 5		40				
.0 8 W	Subgrade	7	50				
s Y		(	60	60		Brown sandy silt	Subgrade
r o r			_70				
۵			80			п	
л Г С	K.		90	<b>v</b>		End of Auger	
لنا ب			100				
	<pre>&lt; &lt; /pre>		110				
			_120_				
			130				

Submitted by 1

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8 - 2 (23)

<sup>(</sup>Soil Engineer)

Sheet No. 8 of 8

### BORING LOG RECORD

Location :	ocation :GEN. TRIAS to AMADEO										
				Experimental Pavement Section No. 3	Boring No. 8						
Date: <u>November</u>	23,	1989	T	Water Table: <u>Did not noticed</u>							
	No. #	Depth from surface	ic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS						
Example Sond , S Clay	Sample	in Cm.	Symbolic	(Indicate color and texture of soil)							
T. Moulders Rock Fragments		10 25	0 0 0 0 0 0	Brown gravelly sand	Shoulder						
<u>م</u>		_20	0_0 0_0 0_0								
С Н А <del>50°000</del> 6ravel прle		_30	2								
		_40									
Pups Sand	8	50 50		Brown sandy silt contain fragments of adobe	Subgrade						
		<u>    60                                </u>									
L L L				<u>_</u>							
		80		End of Auger Hard materials underneath							
M M		90		· · · ·							
		100									
		110									
organic Soli		120									
		130									

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Sheet No. 1 of 8

#### BORING LOG RECORD

Location :\_\_\_\_GEN. TRIAS to AMADEO

Road Classification : <u>Provincial</u> Experimental Pavement Section No. <u>4</u> Boring No. <u>1</u>

Date: \_\_\_\_November 21, 1989 \_\_\_\_\_ Water Table: \_\_\_\_ Did not noticed

<u></u>	<b>™</b> =	No. <b>*</b>	Depth from	Chart	VISUAL IDENTIFICATION OF SOIL	
E xam ple	Sand , Silt Clay	Sample 1	surface in Cm.	Symbolic	(Indicate color and texture of soil)	REMARKS
	Boulders Rock Fragments	-	20	0	Gray crushed gravel with sand	Shoulder
÷			_20 X	0.0		
H A R	0000 0000 1000			0 6 0 9 0 9 8 0 0		
<i>о</i>	Subgrade Sample		40 J	0 0 0 0	Gray brown pea gravel and sand	Subbase
1 B O L	Sand		50 X	000		
¥ X S	o o o		60			
0 R	B-D	1	70		Brown sandy silty clay	Subgrade
LL.	SI		80			
о И Ш	$\square$		<u>90</u> 20		Gray silty clay	
פ ר	Clay		100		n	
	لالحا				Елd of Auger	
	¥ ¥ ¥ ¥ ₩		110			
	organic Soll		120			
			130			

Submitted by :

Sheet No. 2 of 8

#### BORING LOG RECORD

Location : \_\_\_\_\_GEN. TRIAS to AMADEO Road Classification : Provincial Experimental Pavement Section No. 4 Boring No. 2 Water Table: \_\_\_\_ Did not noticed Date: November 21, 1989 Chart ¥ VISUAL IDENTIFICATION OF SOIL Depth No. from <u>0</u> REMARKS Clay surface Example Sample Symbol in Cm. (Indicate color and texture of soil) ----0 0 0 î Rock Fragments \* 6 0 0 0 Gray brown crushed gravel and sand (max. size 40 mm) 1 12 10 According to some residents in the area, during rainy season water at the 20 ŀ ricefield rise about α 40 cm. ۹ T 30 Grave 2 Brown clayey silt and sand υ Subgrade Sample 38 40 \_ о 50 ۵ Sand Z ≻ S 60 X 70 3 40 Gray brown sandy silty clay-0 L 80 ۵ z 90 ы Ø - End of Auger w 100 110 200 120 130

Submitted by 1

Sheet No. 3 of 8

#### BORING LOG RECORD

Location :\_\_\_\_GEN. TRIAS to AMADEO Road Classification : <u>Provincial</u> Experimental Pavement Section No. <u>4</u> Boring No. <u>3</u> Date: November 21, 1989 Water Table : \_\_\_ Did not noticed Chart ж VISUAL IDENTIFICATION OF SOIL Depth No. from Symbolic REMARKS Example surface Sample Clay in Cm. (Indicate color and texture of soil) 00000 Boulders Rock Fragments 12 Gray brown gravelly sand Shoulder 10 20 ⊢ 16 Brown silty sand with some gravel Subgrade ÷ ¢ 4 H 30 υ Subgrade Sample 000 40 ل... З 32 Yellow brown clayey silt 0 ø Sond 50 Z ≻ S 60 C, 70 0 u. 80 40 Gray brown silty clay ۵ z 90 ы c ដ 100 - End of Auger 110 120 130

Submitted by 1

(Soil Engineer)

8 - 2 (27)

Sheet No. 4 of 8

## BORING LOG RECORD

Location :GEN. TRIAS to AMADEO									
				Experimental Pavement Section No. 4	Boring No. 4				
Date: <u>Novembe</u>	r 23	, 1989		Water Table: <u>Dld_not_noticed</u>					
	No. #	Depth from	c Chart	VISUAL IDENTIFICATION OF SOIL	RENARKS				
Example Example Sand , Sill Clay	Somple	surface in cm.	Symbolic	(Indicate color and texture of soil)	REMARKS				
T Soulders Rock Fragments		_10							
r 28°		20	0 0						
A 6001		4	0 0	Gray brown crushed gravelly sand	Shoulder				
C H A 0 0 0 0 0 6 1 0 0 0 6 1 0		_30	0						
<u>[0 0]</u>	· · · ·	40	• •						
M B O L Sand Subgrade		50							
<u>ک</u> آھ	4	<u>60</u> 3		Brown silty clay	Subgrade				
		70							
a line		80							
		90		Gray clay					
		100 v		<u> </u>					
××× 0		<u>110</u>		(Soil is getting wet) End of Auger					
Organ		120							
		130							

Submitted by :

(Soil Engineer)

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Sheet No. 5 of 8

#### Location :\_\_\_\_GEN. TRIAS to AMADEO Road Classification : Provincial \_\_\_ Experimental Pavement Section No. \_4\_\_ Boring No. \_5\_\_\_ Date: \_\_\_\_November 23, 1989 \_\_\_\_Water Table: \_\_\_\_Did\_not\_noticed\_ Chart ж VISUAL IDENTIFICATION OF SOIL Depth No. from and , SII Clay Symbolic REMARKS Example surface Sample in Cm. (Indicate color and texture of soil) *о*.0 Boulders Rock Fragments 0 0 10 20 Gray brown gravelly sand Shoulder 0 0 20 0 ۲ œ CHA 30 Sample 28 Brown silty sand with some pea gravel Subgrade 40 Subgrade ت\_ 0 50 Sand œ Σ ≻ Ø 60 28 5 Brown clayey silt Q. 70 о 1 Ί 80 Ω z 24 90 Yellowish brown clay ы Ø ш 100 End of Auger 110 120 130

#### BORING LOG RECORD

Submitted by :

Sheet No. 6 of 8

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### BORING LOG RECORD

Loco	Location :GEN. TRIAS to AMADEO										
						Experimental Pavement Section No. 4	Boring No6				
Date	Date: <u>November 23, 1989</u> Water Table: <u>Did not noticed</u>										
pie	d . Silt	e No. ¥	Depth O from surface S		1	VISUAL IDENTIFICATION OF SOIL	REMARKS				
Example	Sand	Sampie	in Crr		Symbotic	(Indicate color and texture of soil)					
	Boulders Rock Fragments		10	Î	¢ 0.						
к Т			_20	25	0.0	Gray brown gravelly sand	Shoulder				
C H D	କୁ ୦୦୦ ଏ ୦୦୦୦ ପ୍ର Gravel nple		30	15	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Brown sandy silt and some gravel	Subgrade				
	o o s		40	X	13.01		_				
SYMBOL	Sand	6	50 60	25		A mixture of brown sand silt and clay					
				×	K						
FOR			70 80								
D N E			90	35   		Yellowish brown clay (Soil very soft)					
с Г	Clay		100								
			110			End of Auger					
	organi Soll		120								
			130								

Submitted by 1

Sheet No. 7 of 8

#### BORING LOG RECORD

Location : \_\_\_\_GEN. TRIAS to AMADEO

:

 Road Classification : <a href="Provincial">Provincial</a>
 Experimental Pavement Section No. 4
 Boring No. 7

 Date : <a href="November 23">November 23, 1989</a>
 Water Table : <a href="Did not noticed">Did not noticed</a>

		No. *	Depth from	۱ I	Chart	VISUAL IDENTIFICATION OF SOIL	
Example	Clay	Sample	surfa in Cm.		Symbolic	(Indicate color and texture of soil)	REMARKS
and the second sec	Rock Fragments	-	10	Î			
			20	25	000000000000000000000000000000000000000	Brown sandy silt with gravel	Shoulder
С Н А R 050,0006 050,0006 050,0006 66006	le		30	-X			
	S		40				
N B O	Subgrade		50	45	1, 1, 1 1, 1, 1, 1 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	Brown silty sand	Subgrade
> []]	$\square$		<u>e0</u>		114 111 111 111 111		
F O R			70	-X			
			08				
LEGE		7	100	40	K	Brown clayey silt	
	-		110				
organi	Soli		120				
			130				

Submitted by :

<sup>(</sup>Soil Engineer)

Sheet No. 8 of 8

#### BORING LOG RECORD

Location :\_\_\_\_\_GEN. TRIAS to AMADEO Road Classification : Provincial Experimental Pavement Section No. 4 Boring No. 8 Date: November 23, 1989 Water Table : \_\_\_\_\_ Did not noticed Chart ж VISUAL IDENTIFICATION OF SOIL Depth No. from Sand , SH Clay Symbolic REMARKS Example surface Sample in Cm. (Indicate color and texture of soil) 00 Boulders Rock Fragments Ö 10 0. Ö 0.0 30 Gray brown gravel and sand Shoulder D Q 20 H æ 0 ۹ 0.0 r 30 Gravel O Sample 40 Subgrade ر\_ ο 50 മ Sand Z ۶ 60 S 8 62 Brown clayey silt Subgrade ĸ 70 0 L 80 ۵ z 90 ш σ ы 100 110 120 130

Submitted by 1

Sheet No. 1 of 4

### BORING LOG RECORD

Locotion :TRECE MARTIRES to GEN. M. ALVARES										
Road Clas	sifica	tion	: Natio	onal		Experimental Pavement Section No5	Boring No. 1			
Date:	lovembe	r 24	, 1989			Water Table: <u>Did not noticed</u>				
E xam pte	Sand , Silt Clay	Sample No. *	Dep froi surf in Cm	m ace	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS			
R	le r s Igments		-10-	8		Asphalt Concrete	Surface			
F	Boulders Rock Fragments		-20	  12 	100	Gray brown crushed gravel with a mixture of silty sand	Base			
C H A R	Gravel Sample		<u> </u>							
SYMBOL	Sand Subgrade	1	50 60	70		A mixture of brown sandy silty clay	Subgrade			
F 0 R			70 80							
G E N D	lay		90			End of Auger				
- []	0		100							
× * * * * * * *	Organic Soli		110 120							
<u>ت</u>			130							

Submitted by :

(Soil Engineer)

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Sheet No. 2 of 4

#### BORING LOG RECORD

Location :TRECE MARTIRES to GEN. M. ALVARES										
Road Classification : <u>National</u> Experimental Pavement Section No. <u>5</u> Boring No. <u>2</u>										
Date: <u>November 24, 1989</u> Water Table: <u>Did not noticed</u>										
ote Stitt	×. No.	Dep fro surf	m	lic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS				
Example Sand , Silt Clay	Sample	in Cr	า	Symbolic	(Indicate color and texture of soil).					
T Soulders Rock Fragments		10			Asphalt Concrete	Surface				
~		_20	]   12   ↓		Brown crushed gravel and sand	Base				
H A 0000	pie	30	15		Brown pea gravel and sandy silt	Subbase				
60	sample	40	<b>├X</b>		· · ·					
M B O L Sand	epologa b									
S S	2	_60								
FOR	2	70	53		A mixture of brown sand, silt and clay	Subgrade				
		80		Ø						
		90			· · · · · · · · · · · · · · · · · · ·					
		100			End of Auger					
		110								
0190 Soll		120	-			· .				
		130								

Submitted by :

Sheet No. 3 of 4

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### BORING LOG RECORD

Location :TR	ECE	MARTIRES	o GEN	. M. ALVARES	
				Experimental Pavement Section No. 5	_Boring No. <u>3</u>
Date: <u>Novembo</u>	er 24	,1989	·····	Water Table: Did not noticed	
Example Example Sand , Silt Clay	Sample No. *	Depth from surface in	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL	REMARKS
San	San	Cm.		(Indicate color and texture of soil)	
T Boulders Rock Fragments		10 10		Asphalt Concrete Overlaid	Surface
		10	0,0,0 0,0,0	Brown crushed gravel and sand	Base
С. Н. А. R <sup>2</sup> 50°000 6ravel тріе		30 18	10/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2	Brown sandy silt and peo gravel	Subbase
0 000 0 000 8 0 0000 8 000 8 0000 8 00000000		40 V	1.00	-	
M B O L Sand Subgrade		50			
S S S		60	ALL.		
L C R	з	70 50		Brown clayey silf	Subgrade
		80			
E		90 ¥			
				Grey clay	
		110		End of Auger	
(		120			
		130			

Submitted by :

(Soil Engineer)

Sheet No. 4 of 4

### BORING LOG RECORD

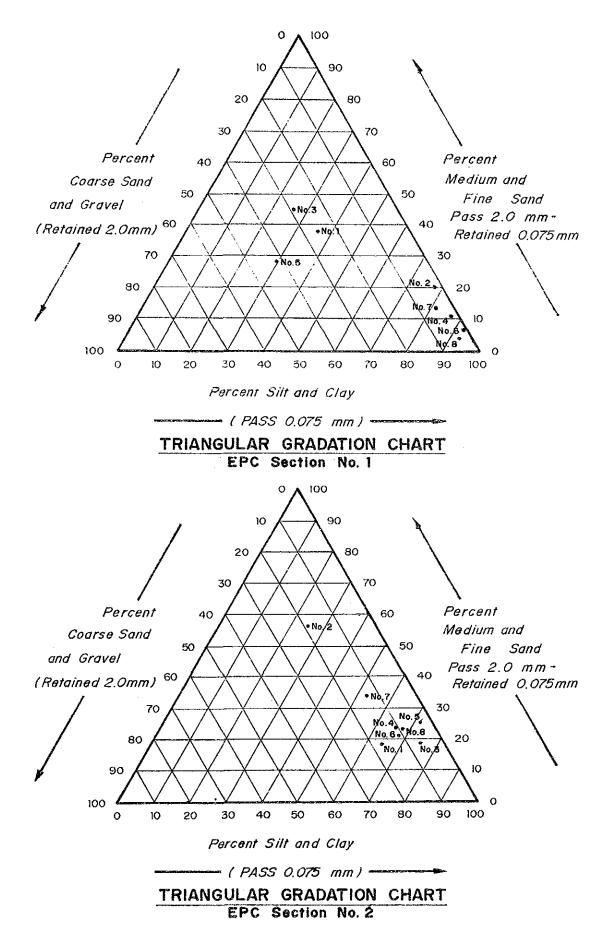
Location :	TRECE	MARTIR	ES to	GEN.	M. ALVARES	
Road Classific	ation	: <u>Nati</u>	onal		Experimental Pavement Section No. 5	Boring No. 4
Date: <u>Noven</u>	nber 2	4, 1985	3		Water Table: <u>Did not noticed</u>	
Example Sand , Silt Clay	Sample No *	Dept from surf in Cra	n Ice	Symbolic Chart	VISUAL IDENTIFICATION OF SOIL (Indicate color and texture of soil)	REMARKS
T Evolders Rock Fragments		10	15		Asphalt Concrete Overlaid	Sur face
2		20	10	00 00 00 000	Brown crushed gravely sand	Base
H A H O 000		30	X	00		
S C O		40				
M B O L Sand Subgrade		50				
s so	4		70		Brown clayey silt	Subgrade
۲ <u>۲</u>		70				
		80				
C E E		90			Ŋ -	
		100	¥	~~~	End of Auger	-
		110				
Organ Soit		120				
		130				

Submitted by 1

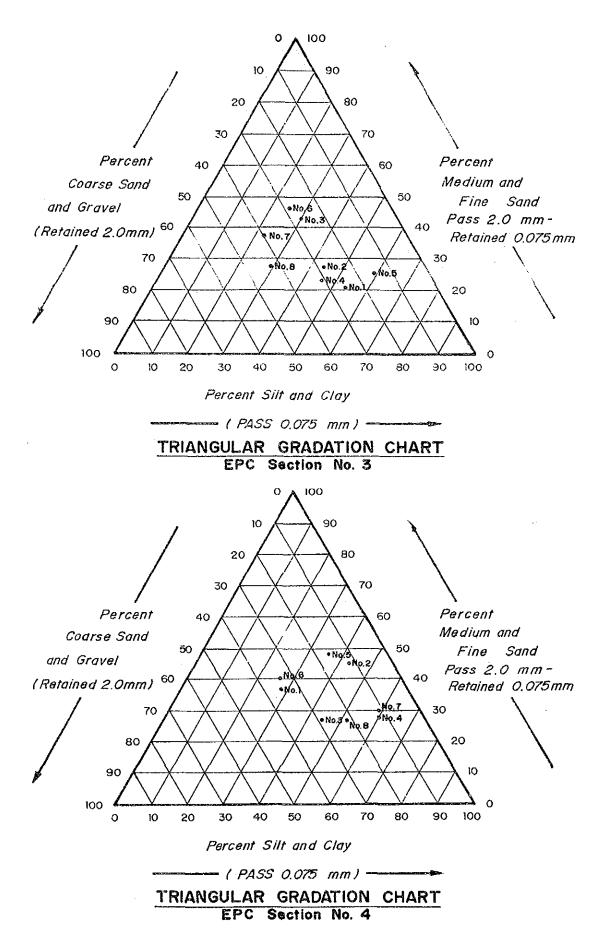
<sup>(</sup>Soil Engineer)

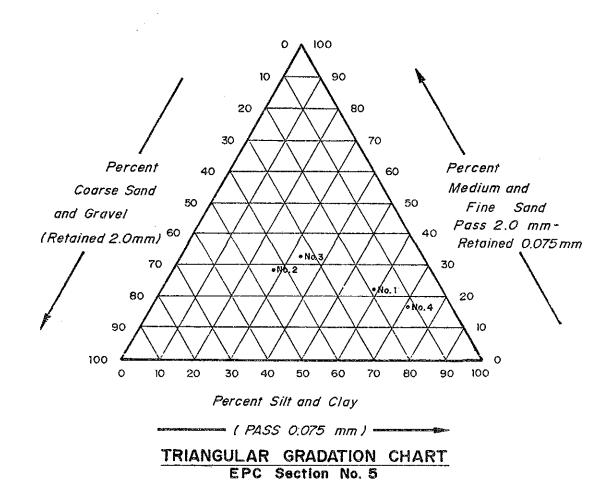
## Appendix 8–3

# SOIL SIEVE ANALYSIS RESULTS BY TRIANGULAR GRADATION CHARTS



8-3 (1)





8 - 3 (3)

Appendix 8-4

### TEST RESULTS OF PAVEMENT MATERIALS

Table 8.4-1 Base Course Aggregate

		Blended Crushed Aggregate
		Puray Quarry, Montalban, Rizal
Proposed Use	:	Base Course

Fest Items			Specification Item 202
			********
Sieve Analysis (% Passin	9)		
Sieve Size	0.	100	100
37.5 mm	8		100
25.0 mm	8	75	60-85
19.0 mm	ጜ	62	60-85
12.5 mm	8	54	-
9.5 mm	8	49	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
4.75 mm	8	40	30-55
2.00 mm	8	31	
0.425 mm	*	13	8-25
0,075 mm	ક	7	2-14
Liguid Limit		NP	<25
Plasticity Index		NP	< 6
Moisture Density Relatio	n		
(AASHTO T-180 C)			
Maximum Dry Density	kg/m^3	2368	
Optimum Moisture			
Content	ጽ	5.8	
California Bearing			
Ratio (At MDD)	*	131	>80
Swell	8	0	

Table 8.4-2 Subbase Course Aggregate

Materials	: River-run Sandy Gravel
Source	: Mamba Quarry, Cavite Mamba River
Proposed Use	: Bubbase Course

Test Items		Results	Specification Item 200
Sieve Analysis (% Passing			
Sieve Size	-		
50.0 mm	R	100	100
37,5 mm	\$	94	-
25.0 mm	8	75	55-85
19.0 mm	ъ.	66	-
12.5 mm	<b>%</b>	57	-
9,5 mm	<del>አ</del>	52	40-75
4.75 mm	ጜ	43	
2.00 mm	ጜ	33 -	-
0.425 mm	8	14	
0.075 mm	ጜ	7	0-12
Liquid Limit		NP	<35
Plasticity Index		NP	<12
Moisture Density Relation			
(AASHTO T-180 C)			
Maximum Dry Density	kg/m^3	1963	
Optimum Moisture			
Content	8	10.2	
California Bearing			
Ratio (At MDD)	æ	109	>25
Swell	殆	0.07	

Remarks : Sample meets Specification Requirements

Table 8.4-3 Fine Aggregate for PCC

Materials : Sand Source : Betonval Concrete Aggregate Proposed Use : Portland Cement Concrete

Test Results Specification Test Items Item 311 Sieve Analysis (% Passing) Sieve Size .... 100 8 9.5 ສາກ 95-100 4.75 90 8 រាហា 80 8 2.36 mm 45-80 65 <u></u> 1.18 mn 0.600 mm 8 34 12 5-30 8 0,300 mm 2 0.150 mm 0.075 mm 0-10 9 Ъ. 0.3 -Fineness Modulus 8 3.21 2.55 Bulk Specific Gravity (SSD) 8 Absorbtion Я. 2.83 æ 4.0 Moisture Content . \_\_\_\_\_

Remarks : Sample meets Specification Requirements

Table 8.4-4Coarse Aggregate for PCCMaterials: Blended Crushed AggregateSource: Betonval Concrete AggregateProposed Use: Portland Cement Concrete

\_\_\_\_ Test Results Specification Test Items Item 311 Sieve Analysis (% Passing) Grading C Sieve Size ъ 50.0 រលា 100 95-100 37.5 97 8 mm 67 35-70 mm Я. 25.0 19.0 mm ጜ 53 ---10-30 12.5 <u>ዓ</u> 24 mm 9.5 Я. 12 mm 4.75 mm 0.075 mm 0~5 8 3 0.8 Я. Bulk Specific Gravity (SSD) 2.79 Absorbtion 8 1.33 8 Moisture Content 0.37 

Remarks : Sample meets Specification Requirements

Source	: 20 mm Max. size Crushe : Puray Quarry, Montalba	n, Riza	
Fest Items	Tes	t Resul	
به بعد هم بند به بر بر بر بر بر بر بر با بر			**********
Sieve Analysis (%	Passing)		
Sieve Size		100	
19 mm	8	100	
12.5 mm	95 8	71	
9.5 mm 4.75 mm	8	54	
4.75 mm	85 0	23	
2.36 mm 1.18 mm	8	15	
	- 38 - 38	10 9	
0.600 mm 0.300 mm	· 75 %	9	
0.150 mm	ъ Ъ	5	
	-	4	
0.075 mm	*		
0.075 mm 	¥ : Fine Aggregate (Sand) : Puray Quarry, Montalba		1
2. Material Source Test Items	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tøst Result	n, Riza	Specification
2. Material Source Test Items	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result	n, Riza	Specification
2. Material Source Test Items Sieve Analysis (%	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result	n, Riza	Specification Item 311
2. Material Source Fest Items Sieve Analysis (% Sieve Size	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result Passing)	n, Riza s	Specification
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result	n, Riza	Specification Item 311 Grading
2. Material Source Test Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result Passing) %	n, Riza s	Specification Item 311 Grading
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result Passing) %	n, Riza s 100 100 93 70	Specification Item 311 Grading 
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Tost Result Passing) % % %	n, Riza s 100 100 93 70	Specification Item 311 Grading 
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm 2.36 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Test Result Passing) % % %	n, Riza s 100 100 93	8pecification Item 311 Grading 
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm 2.36 mm 1.18 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Test Result Passing) % % % % %	n, Riza s 100 100 93 70 49	Specification Item 311 Grading 
2. Material Source Fest Items Gleve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm 2.36 mm 1.18 nm 0.600 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Test Result Passing) % % % % % % %	n, Riza s 100 100 93 70 49 30	Specification Item 311 Grading 80-100 65-100 40-80 20-65
2. Material Source Fest Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm 2.36 mm 1.18 mm 0.600 mm 0.300 mm 0.150 mm 0.150 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Test Result Passing) % % % % % % % % % % % % % % % % % % %	n, Riza s 100 100 93 70 49 30 13 5 3	Specification Item 311 Grading 
2. Material Source Fost Items Sieve Analysis (% Sieve Size 12.5 mm 9.5 mm 4.75 mm 2.36 mm 1.18 nm 0.600 mm 0.300 mm 0.150 mm	: Fine Aggregate (Sand) : Puray Quarry, Montalba Test Result Passing) % % % % % % % % % % % % % % % % % % %	n, Riza 8 100 100 93 70 49 30 13 5	Specification Item 311 Grading 

3. Grading of Composite Aggregate

Aggregate Proportion 20 mm Max. size Crushed Stone Fine Aggregate (Sand)

50% 50%

Grading of Composite Aggregate

Jiave Size ·		Cumulative % Passing	Bpecification Grading Range: 310 Type			
19	mm	100	100			
12.5	mm	85	••			
9.5	ताम	77	-			
4.75	mm	58	45-60			
2.36	mm	43	33~53			
1.18	៣ផេ	30	~			
0.06	mm	19	~			
0.300	mn	11	10~20			
0.150	រាហា	5	•			
0.075	mm · · ·	4	3~8			

Table 8.4-6 Design of Concrete Mixture

A. Mixing Proportion Per Bag of Cement

Cement			-1			-	••	~		40.0 kg.
Coarse Agg.	•••		**	~			•••	••		154.36 kg.
Fine Agg	-	~	~	~	~					62.37 kg.
Water			-		•••		***		-	18.51 kg.

B. Properties of Concrete Mix

Cement factor \_\_\_\_\_ 9.1 bags/m<sup>\*</sup>3
 Water Cement Ratio \_\_\_\_\_ 0.42
 Slump \_\_\_\_\_ 63.5 mm (2.5")

C. Strength of Concrete

1. Flexural strength (at 14 days), MPa (Psi)

Sample	#1		-		 -	-	-		-	-	3.92	(569)	
-	# 2			•	 		-	***			4.52	(656)	
Average	, – e	-	-	-	 	-	-	-	**	-	4.22	(612)	

Remarks : Gradation for Coarse and Fine Aggregates are shown in Tables 8.1-13 and 8.1-14. The Flexural strength meets Specification Requirements (550 psi).

Table 8.4-7 Materials : Straight Asphalt 60-70 Source : Petrophil Proposed Use : Asphalt Concrete Mixture \_\_\_\_\_ Test Results Specification Test Items \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ Penetration at 25 c 100 g, 60-70 68 5 sec С 307 >232 Flush Point COP >100 >100 Ductility 25 c cm <0.8 0.1 Loss of heating 8 99.9 >99.0 Solubility in trichloethylene ૠ Residue 87 >54 Penetration % of original >50 >100 Ductility 25 cm/min, cm Negative Negative Spot Test ecific Gravity 1.01 Specific Gravity Remarks : Sample meets Specification Requirements Note : BRS Laboratory No. 688-89

Table 8.4-8

Materials : Cub-Back Asphalt MC-70 Source : Petrophil Source : Petrophil Proposed Use : Prime Coat Test Results Specification AASHTO M-82 Test Items Distilate, % by volume of total distilate to 360 C 8 0 0 to 190 C 8 11 0-20 to 225 C 8 68 65-90 to 315 C 78 C S 70-140 Kinetic Viscocity at 60 C °c > 3 8 \_ Flush Point TOC Negative Negative Spot Test Residue by distilation ъ 63 > 5 5 at 360 C 0.93 Specific Gravity Residue 169 120-250 Penetration, 25 C ст >100 > 5 0 Ductility, 25 C Solubility in 8 99.9 >99.0 trichlo-ethelen \_~\_\_\_ Remarks : Sample meets Specification Requirements Note : BRS Laboratory No. 12459-88

Table 8.4-9

Materials	: Emulsified Asphalt SS-1
Source	: Petrophil
Proposed Use	: Tack Coat

Test Items	Test I	Results	Specification AASHTO M-140	
Viscosity				
(Saybolt furol) 25 C	3	36	20-100	
Stability	ኤ	0.6	<1.0	
Cement mixing	ጜ	1.3	<2.0	
Sieve test	<b>9</b> 8	0.1	>0.1	
Residue by distilation	28	. 59	>57	
Residue				
Penetration, 25 C, 100g,				
5 sec		163	100-200	
Ductility 25 C	cm	>100	>40	
Solubility in tricloethlene	8	99.9	>97.5	
Specific Gravity		1.02		

Remarks : Sample meets Specification Requirements Note : BRS Laboratory No. 690-89 Table 8.4-10

Materials	:	Cement	
Source	:	Betonval	Readyconcrete Inc.
Proposed Use	1	Portland	Cement Concrete

rest Items	Test	Results	Specification
Fineness:			
Residue on No. 200, sieve	*	95	
Specific Gravity 3.15;	0	55	
Normal consistency	8	25	
Soundness:	v	20	
Autoclave expansion	8		0.8 Max.
Pat Test	v	Passed	
Fime of setting:			
Initial set, minutes		135	60 Min.
Final set, hours		3.5	10 Max.
Air Content of Mortar,			
% by volume		6.0	12 Max.
Compressive strength,			
Avg. mortar cubes,			
kg/cm <sup>2</sup> : (Flow, %)		112	
l day in moist air,			
2 days in water		175	126 Min.
l day in moist air,			
6 days in water		230	196 Min.
l day in moist air,			
27 days in water		to follow	
Loss on ignition	ጽ	1.65	3.0 Max.
Insoluble residue	ጜ	0.50	0.75 Max
Sulfur trioxide (SO3)	2	2.0	3.0 Max.
Magnesium oxide (MgO)	ક્ર	2.40	5.0 Max.

Remarks : Sample meets Specification Requirements

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Appendix 8–5

### DESIGN EQUATION AND DESIGN CHART

The basic design equation based on serviceabilityperformance concept for flexible pavement of the AASHTO Guide for Design of Pavement Structures, 1986, is as follows:

$$\log_{10} (W_{18}) = Z_R \times S_0 + 9.36 \times \log_{10} (SN+1) - 0.20$$
  
+ 
$$\frac{\log_{10} \left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}}$$
  
+ 2.32 ×  $\log_{10} (M_R) - 8.07$ 

Where:

W<sub>18</sub> = predicted number of 18-kip equivalent single axle load application.

Z<sub>R</sub> = standard normal deviate

S<sub>0</sub> = combined standard error of the traffic prediction and performance prediction.

 $\Delta$  PSI = difference between the initial design serviceability index, P<sub>0</sub>, and the design terminal serviceability index P<sub>t</sub>, and

M<sub>R</sub> ≈ resilient modulus (psi)

SN = structural number

$$SN = a_1D_1 + a_2D_2m_2 + a_3D_3m_3$$

where

 $a_i = i^{th}$  layer coefficient,

 $D_i = i^{th}$  layer thickness (inches) and

 $m_i = i^{th}$  layer drainage coefficient.

AASHTO Basic Design Equation for Flexible Pavement

The basic design equation based on serviceabitility performance concept for rigid pavement of the AASHTO Guide for Pavement Structures, 1986 , is as follows ;

$$\log_{10}(W_{18}) = Z_R \times S_o + 7.35 \times \log_{10}(D+1)$$
  
- 0.06 + 
$$\frac{\log_{10} \left[\frac{\Delta PSI}{4.5 - 1.5}\right]}{1 + \frac{1.624 \times 10^7}{(D+1)^{8.46}}}$$

+  $(4.22 - 0.32 \times p_t)$ 

$$x \log_{10} \left[ \frac{S_{c}^{1} x C_{d} x (D^{0.75} - 1.132)}{215.63 x J \left[ D^{0.75} - \frac{18.42}{(E_{c}/k)^{0.25}} \right] } \right] (1.2.2)$$

where

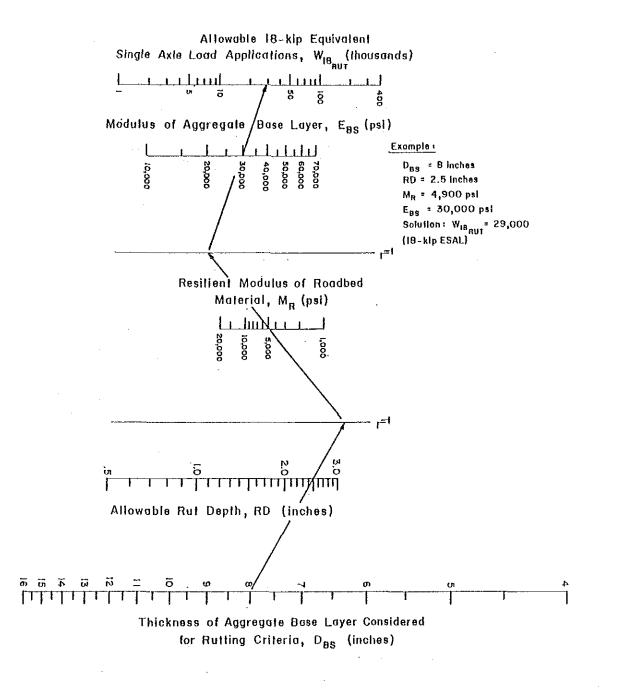
$$W_{18} = \operatorname{predicted number of 18-kip equivalent}_{single axle load applications,} S_{c}^{l} = \operatorname{modulus of rupture (psi) for portland}_{cement concrete used on a specific project,}$$

$$Z_{R} = \operatorname{standard normal deviate,}_{J} = \operatorname{load transfer coefficient used to adjust}_{for load transfer characteristics of a specific design,}$$

$$D = \operatorname{thickness (inches) of pavement slab,}_{c} C_{d} = \operatorname{drainage coefficient,}_{cement concrete, and}$$

$$E_{c} = \operatorname{modulus of elasticity (psi) for portland}_{cement concrete, and}$$

$$k = \operatorname{modulus of subgrade reaction (pci).}$$





AASHTO Guide for Design of Pavement Structures 1986 , Part II , Chapter 4 Low-Volume Road Design

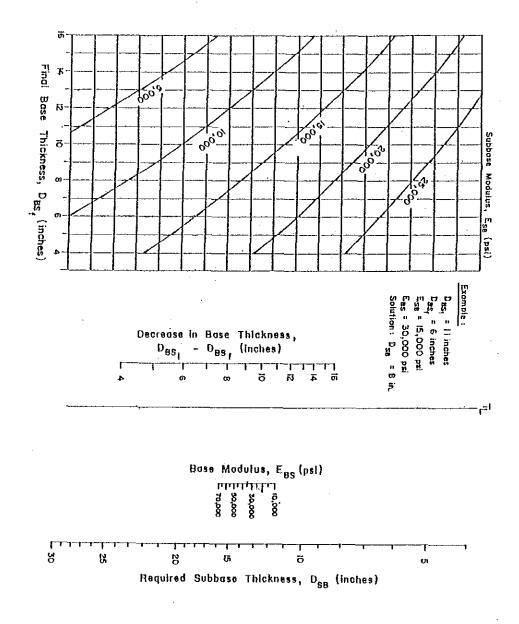
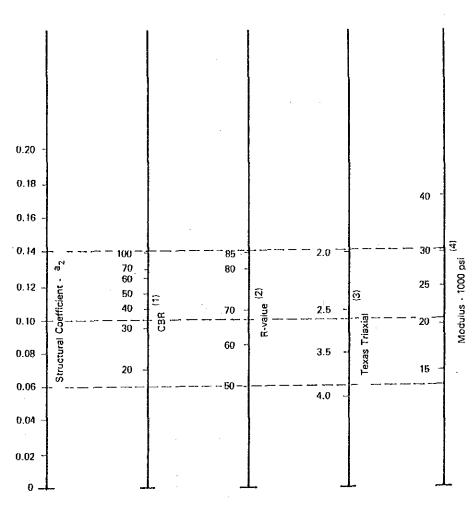


Figure 4.5. Chart to convert a portion of the aggregate base layer thickness to an equivalent thickness of subbase.

AASHTO Guide for Design of Pavement Structures 1986, Part II , Chapter 4 Low-Volume Road Design



**{1**}

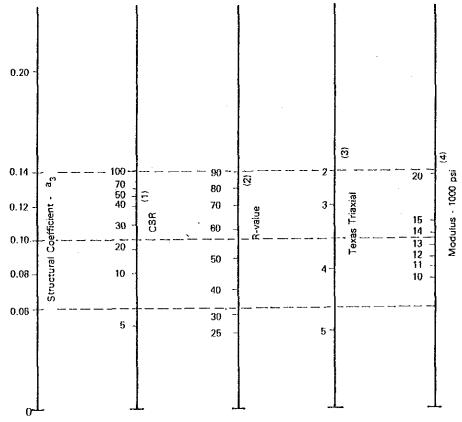
Scale derived by averaging correlations obtained from Illinois. Scale derived by averaging correlations obtained from California, New Mexico and Wyoming. Scale derived by averaging correlations obtained from Texas. Scale derived on NCHRP project (3). {2}

{3}

{4}

Figure 2.6. Variation in granular base layer coefficient (a  $_2$  ) with various base strength parameters (3).

AASHTO Guide for Design of Pavement Structures 1986, Part II , Chapter 2 Design Requirments



(1) Scale derived from correlations from Illinois.

(2) Scale derived from correlations obtained from The Asphalt Institute, California, New Mexico and Wyoming.

(3) Scale derived from correlations obtained from Texas.

(4) Scale derived on NCHRP project (3).

Figure 2.7. Variation in granular subbase layer coefficient (a<sub>3</sub>) with various subbase strength parameters (3).

AASHTO Guide for Design of Pavement Structures 1986, Part II , Chapter 2 Design Requirments Appendix 8–6

# STRUCTURAL DESIGN OF EXPERIMENTAL PAVEMENT MODELS

Structural Design of Gravel Surfaced Road

Design Method

AASHTO Guide for Design of Pavement Structure 1986, Chapter 4 Low-Volume Road Design, Figure 4.3 Design Chart for aggregate surfaced roads considering allowable rutting.

Section No. 1 Model No. 1 GR Surfaced Road

Design ConditionNumber of heavy vehicles at initial year: 7/day-directionVehicle load factor: 0.503Traffic growth rate: 3 percent p.a.Design period: 5 yearsSubgrade CBR: 4%CBR of gravel layer: 50%

Structural Design

(1) Required gravel surface layer thickness (D<sub>BS</sub>)

 $D_{BS} = 6.0$  in

was obtained from the above mentioned design chart as shown in Figure 4.3 with the following design input data.

W : ESAL for 5 years = 7 x 0.503 x (1.03<sup>B</sup> - 1.0)/0.03 = 6.28x 10<sup>3</sup> E<sub>BS</sub> : 24,000 psi for gravel layer of CBR % M<sub>R</sub> : 6,000 psi for subgrade of CBR 4% Allowable rut depth : 2.5 in where E<sub>BS</sub> : Elastic modulus of gravel layer (the above value was obtained from Figure 2.6 chart.

 $M_{R}$  : Resilience modulus of subgrade ( $M_{R}$  = 1500 x CBR)

(2) Gravel loss

Following equation based on Kenya Transport Cost Study was used.

```
AGL = f {(T<sup>2</sup>/T<sup>2</sup>+50)}(4.2+0.927T+3.50R<sup>2</sup>+1.88VC)
where, AGL = annual gravel loss, in mm
    T = annual traffic volume in both directions, in
        thousands of vehicles
    R = annual rainfall, in mm
    Vc = average percentage gradient of road
    f = 0.94 for lateritic gravels
        1.1 for quartizitic gravels
        0.7 for volcanic gravels
        1.5 for coral gravels
```

8 - 6 (1)

In this design, the following values are adopted.

- $T = 180 \times 365/1000 = 6.37$
- (180 Vehicles/day)
- R = 2.92/100 = 2.09 (average rainfall in Cavite Province from 1984 to 1988 was 2.092 mm)
- Vc = 3.0
   (Actual gradient of Model No. 1 road section is
   about 3%.)
- f = 1.1AGL = 13.6 mm and GL (5 years) = 68mm = 2.68 in
- (3) Required gravel surface layer thickness including aggregate loss assuming 50% of GL will be recovered by regrading and regravelling maintenance operation.
   Required total gravel layer thickness
   = D<sub>PS</sub> + 0.5 x GL = 6.0 x 1.34 = 7.34 in = 18.6 cm
- (4) Thickness of gravel surface layer and subbase layer

A 15 cm gravel surface was adopted for the experimental model. Remaining 3.6 cm portion of the gravel layer (18.6 cm - 15.0 cm = 3.6 cm) was converted to a equivalent thickness of subbase by using the design chart in AASHTO Guide for Design of Pavement Structures 1986, Chapter 4 Low-volume Design shown in Figure 4.5 Design Chart.

From this chart, 3.6 cm (1.4 in) is equivalent to 5 cm (2 in) was obtained.

where, E<sub>BS</sub> : 24,000 psi for gravel layer of CBR 50% E<sub>SB</sub> : 14,000 psi for subbase of CBR 25% (Figure 2.7 Chart)

Therefore, the design thickness is : Gravel Surface layer = 15 cm Subbase layer = 5 cm

Section No. 2 Model No. 5 GR Surfaced Road

Design Condition Number of heavy vehicles at initial year: 7/day-direction Vehicle load factor : 0.503 Design period : 5 years Subgrade CBR : 3.0% Other conditions are same as Model No. 1. Structural Design

(1) Required gravel surface layer thickness (D<sub>BS</sub>)

 $D_{BS} = 6.7$  in

was obtained from the design chart for  $W = 6.82 \times 10^3$   $E_{BS} = 24,000$  psi  $M_R = 4,500$  psi for subgrade of CBR 3% allowable rut depth : 2.5 in

(2) Gravel loss

AGL = 9.7 mm was obtained from AGL formula.

where,  $T = 140 \times 365/1,000 = 5.11$  (140 Vehicles/day) R = 2.09 Vc = 3.0 f = 1.1GL (5 years) = 49 mm = 1.93 in

 (3) Required gravel surface layer thickness including aggregate loss assuming 50% of GL will be recovered by regrading and gravelling maintenance operation. Required total gravel layer thickness
 = D<sub>BS</sub> + 0.5 x GL = 6.7 + 0.97 = 7.67 in = 19.5 cm

Thickness of Gravel Layer and Subbase Layer 15 cm gravel surface was adopted. Remaining 4.5 cm (19.5 cm - 15.0 cm) portion of the gravel layer is equal to 8 cm subbase was obtained from same method, as Model No. 1.

The design thickness is: Gravel Surface Layer = 15 cm Subbase Layer = 8 cm

Structural Design of Asphalt Pavement

Design Method

AASHTO Guide for Design of Pavement Structures (1986) The Basic Design Equation for Flexible Pavements

#### Section No. 1

ESAL at initial year = Number of Heavy Vehicles / day-direction x Vehicle Load Factor x 365 = 7(Truck) x 0.503 x 365 = 1.29 x 10<sup>9</sup>

SBST Pavement Model No. 2 Design Subgrade CBR = 4.0% (MR =  $1,500 \times CBR$  = 6,000 psi) Pavement Structure and SN Materials t<sub>i</sub>(em) t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Layer a 1 M 1 Surface SBST 0.25 0.125 0.5 Crushed Stone Base 15 0.135 0.9 1.8225 Sandy Gravel 8 Subbase 0.10 0.9 0.72 23.5 cm SN = 2.71/2.6675 = 1.050Predicted number of ESAL ₩: for SN = 1.050, MR = 6,000 psi and  $p_t = 1.5$  $W = 2.59 \times 10^{9}$ n : Predicted performance period for initial year ESAL =  $1.29 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 2.59 \times 10^{3}$ n = 2.0 years 2 years Model No. 3 DBST Pavement Design Subgrade CBR = 4.0% (MR = 1,500 x CBR = 6,000 psi) Pavement Structure and SN Layer Materials t<sub>1</sub>(cm) t, x a, x mi ai M 1 Surface SBST 1.5 0.25 0.375 Crushed Stone 15 0.135 0.9 1.8225 Base Subbase Sandy Gravel 9 0.10 0.9 0.81 SN = 3.0075/2.54 = 1.18425.5 cm Predicted number of ESAL w:  $W = 4.71 \times 10^3$ for SN = 1.184, MR = 6.000 psi and  $p_t = 1.5$ n : Predicted performance period for initial year ESAL =  $1.29 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 4.71 \times 10^3$ n = 3.5 years 4 years Model No. 4 BMP Pavement Design Subgrade CBR = 4.0%Pavement Structure and SN Layer Materials t<sub>1</sub>(cm) a, m 1 t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Surface SBST 5 0.30 0.25 Crushed Stone 15 0.9 Base 0.135 1.8225 Subbase Sandy Gravel 5 0.10 0.9 0.45 25 cm SN = 3.5225/2.54 = 1.387Predicted number of ESAL w: for SN = 1.387, MR = 6,000 psi and  $p_t = 1.5$  $W = 1.08 \times 10^4$ n : Predicted performance period for initial year ESAL =  $1.29 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 1.08 \times 10^4$ n = 7.5 years 8 years

ESAL at in	nitial year				
	per of Heavy Vehic	les / day-	directio	n x V	ehicle Load
	factor x 365	•			
= 7(Tr	uck) x 0.503 x 36	5 = 1,285			
Model No.	6 SBST Pavement				
Design Sub	grade CBR = 3.0%	(MR = 1, 50)	0 x CBR	= 4,5	00 psi)
Pavement S	Structure and SN				
Layer	Materials	ti(cm)	a i	m 1	t <sub>i</sub> x a <sub>i</sub> x
Surface	SBST	0.5	0.25		0.125
Base	Crushed Stone	15	0.1335	0.9	
Subbase	Sandy Gravel	12	0.10	0.9	1.08
		27.5 cm	n SN =	3.02	75/2.54 = 1
	eted number of ESA				
	J = 1.192, MR = 4,		1d pt = 1	.5	$W = 2.52 x^{-1}$
	ted performance p			o din -	
for in	nitial year ESAL =	1.29 x 10			
for in		1.29 x 10			n = 1.9 yea
for in	nitial year ESAL =	1.29 x 10			
for in rate 3	nitial year ESAL =	1.29 x 10			n = 1.9 yea
for ir rate 3 Model No.	nitial year ESAL = 3.0% p.a. and W =	1.29 x 10 2.52 x 10	93		n = 1.9 yea 2 yea
for in rate 3 Model No. Design Sub	nitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement	1.29 x 10 2.52 x 10	93		n = 1.9 yea 2 yea
for in rate 3 Model No. Design Sub	hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement ograde CBR = 3.0% Structure and SN Materials	$1.29 \times 10$ 2.52 × 10 (MR = 1,50 t <sub>1</sub> (cm)	93 00 x CBR a1		n = 1.9 yea 2 yea 00 psi) t <sub>i</sub> x a <sub>i</sub> x 1
for in rate 3 Model No. Design Sub Pavement S Layer Surface	hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement ograde CBR = 3.0% Structure and SN Materials SBST	$(MR = 1,50)$ $t_{i}(cm)$ $1.29 \times 10$	$a_1$ 0.25	= 4,5 mi	n = 1.9 yea 2 yea 00 psi) t <sub>i</sub> x a <sub>1</sub> x 1 0.375
for in rate 3 Model No. Design Sub Pavement S Layer Surface Base	<pre>hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement bgrade CBR = 3.0% Structure and SN Materials SBST Crushed Stone</pre>	$(MR = 1,50)$ $t_{1}(cm)$ $1.5$ $15$	a <sub>1</sub> 0.25 0.135	= 4,5 m <sub>1</sub> 0.9	n = 1.9 yea 2 yea 00 psi) t <sub>1</sub> x a <sub>1</sub> x 1 0.375 1.8225
for in rate 3 Model No. Design Sub Pavement S Layer Surface	hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement ograde CBR = 3.0% Structure and SN Materials SBST	$(MR = 1,50)$ $t_{i}(cm)$ $1.29 \times 10$	$a_1$ 0.25	= 4,5 mi	n = 1.9 yea 2 yea 00 psi) t <sub>i</sub> x a <sub>1</sub> x 1 0.375
for in rate 3 Model No. Design Sub Pavement S Layer Surface Base	<pre>hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement bgrade CBR = 3.0% Structure and SN Materials SBST Crushed Stone</pre>	$1.29 \times 10$ $2.52 \times 10$ $(MR = 1,50$ $t_1(cm)$ $1.5$ $15$ $14$	0 x CBR 0.25 0.135 0.10	= 4,5 <sup>m<sub>1</sub></sup> 0.9 0.9	n = 1.9 yea 2 yea 00 psi) t <sub>1</sub> x a <sub>1</sub> x 1 0.375 1.8225
for ir rate 3 Model No. Design Sub Pavement S Layer Surface Base Subbase w: Predic	<pre>hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement bgrade CBR = 3.0% Structure and SN Materials SBST Crushed Stone Sandy Gravel eted number of ESA</pre>	$1.29 \times 10$ $2.52 \times 10$ $(MR = 1,50)$ $t_{1}(cm)$ $1.5$ $15$ $14$ $20.5 cm$ $L$	$a_1$ 0 x CBR 0.25 0.135 0.10 0. SN =	= 4,5 $m_1$ 0.9 0.9 3.45	n = 1.9 yea 2 yea 00 psi) $t_1 \propto a_1 \propto 1$ 0.375 1.8225 1.26 75/2.54 = 1
for ir rate 3 Model No. Design Sub Pavement S Layer Surface Base Subbase w: Predic for SN	<pre>hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement bgrade CBR = 3.0% Structure and SN Materials SBST Crushed Stone Sandy Gravel eted number of ESA I = 1.361, MR = 4,</pre>	$(MR = 1,50)$ $(MR = 1,50)$ $t_{i}(cm)$ $1.5$ $15$ $14$ $20.5 cm$ $L$ $500 psi an$	$a_1$ 0 x CBR 0.25 0.135 0.10 0. SN =	= 4,5 $m_1$ 0.9 0.9 3.45	n = 1.9 yea 2 yea 00 psi) $t_1 \propto a_1 \propto 1$ 0.375 1.8225 1.26 75/2.54 = 1
for ir rate 3 Model No. Design Sub Pavement S Layer Surface Base Subbase w: Predic for SN n : Predic	<pre>hitial year ESAL = hitial year ESA Structure and SN    Materials    SBST    Crushed Stone    Sandy Gravel eted number of ESA h = 1.361, MR = 4, hitial year ESAL = hitial year ESAL</pre>	$(MR = 1,50)$ $(MR = 1,50)$ $t_{i}(cm)$ $1.5$ $15$ $14$ $20.5 cm$ $L$ $500 psi an$ $eriod$	$p_0 x CBR$ $a_1$ 0.25 0.135 0.10 $a_2$ $a_3$ $a_4$ $a_1$ $a_1$ $a_1$ $a_2$ $a_1$ $a_1$ $a_1$ $a_2$ $a_1$ $a_1$ $a_2$ $a_1$ $a_1$ $a_2$ $a_1$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_3$ $a_1$ $a_2$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_1$ $a_2$ $a_1$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_3$ $a_1$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_2$ $a_1$ $a_2$ $a_2$ $a_2$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$ $a_3$ $a_1$ $a_2$	= 4,5 $m_1$ 0.9 0.9 3.45 .5	n = 1.9 yea 2 yea 00 psi) t <sub>i</sub> x a <sub>1</sub> x 1 0.375 1.8225 1.26 75/2.54 = 1 W = 4.99 x
for ir rate 3 Model No. Design Sub Pavement S Layer Surface Base Subbase w: Predic for SN n : Predic for in	<pre>hitial year ESAL = 3.0% p.a. and W = 7 DBST Pavement bgrade CBR = 3.0% Structure and SN Materials SBST Crushed Stone Sandy Gravel eted number of ESA I = 1.361, MR = 4,</pre>	$(MR = 1,50)$ $(MR = 1,50)$ $t_{i}(cm)$ $1.5$ $15$ $14$ $20.5 cm$ $L$ $500 psi an$ $eriod$ $1.29 x 10$	$p_{0}^{a_{1}}$ $p_{0}^{a_{1}}$ $p_{1}^{a_{2}}$ $p_{2}^{a_{1}}$ $p_{2}^{a_{1}}$ $p_{3}^{a_{1}}$ $p_{4}^{a_{1}}$ $p_{5$	= 4,5 $m_1$ 0.9 0.9 3.45 .5 ic gr	n = 1.9 yea 2 yea 00 psi) t <sub>i</sub> x a <sub>1</sub> x 1 0.375 1.8225 1.26 75/2.54 = 1 W = 4.99 x

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Model No. 8 BMP Pavement Design Subgrade CBR = 3.0% (MR =  $1,500 \times CBR = 4,500 \text{ psi}$ ) Pavement Structure and SN Materials t<sub>1</sub> (cm) aı mi ti xai xmi Layer SBST 5.0 0.25 1.25 Surface ----Crushed Stone 15 0.135 0.9 1.8225 Base Subbase Sandy Gravel 10 0.10 0.90 0.9 30 cm SN = 3.9725/2.54 = 1.564Predicted number of ESAL w: for SN = 1.564, MR = 4,500 psi and  $p_t = 1.5$  $W = 1.08 \times 10^{-4}$ n : Predicted performance period for initial year ESAL =  $1.29 \times 10^3$ , traffic growth rate 3.0% p.a. and W =  $1.08 \times 10^4$  n = 7 n = 7.6 years 8 years Section No. 3 and Section No. 4 ESAL at initial year = Number of Heavy Vehicles / day-direction x Vehicle Load Factor x 365  $= [24(Truck) \times 0.992 + 2(Bus) \times 0.038] \times 365 = 8,718$ Model No. 9 DBST Pavement Design Subgrade CBR = 3.0% (MR = 1,500 x CBR = 4,500 psi) Pavement Structure and SN Layer Materials t<sub>i</sub>(cm) ai t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> m. Surface SBST 1.5 0.25 0.375 ----Crushed Stone 15 0.135 0.9 1.8225 Base Sandy Gravel 30 0.10 0.9 2.70 Subbase SN = 4.8925/2.54 = 1.92846.5 cm Predicted number of ESAL w: for SN = 1.928, MR = 4,500 psi and  $p_{\pm} = 1.5$  W = 3.74 x 10<sup>4</sup> n : Predicted performance period for initial year ESAL =  $8.71 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 3.74 \times 10^4$ n = 4.1 years 4 years

Model No. 10 BMP Pavement Design Subgrade CBR = 3.0% (MR =  $1,500 \times CBR = 12,000 \text{ psi}$ ) Pavement Structure and SN t1(cm) t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Materials Layer aı m 1 1.250 Surface BMP 5 0.25 Base Crushed Stone 150.135 0.9 1.8225 Subbase 26 0.90 2.34 Sandy Gravel 0,9 46 cm SN = 5.4125/2.54 = 2.131Predicted number of ESAL W: for SN = 2.131, MR = 4,500 psi and  $p_t = 1.5$  $W = 7.00 \times 10^4$ n : Predicted performance period for initial year ESAL =  $8.27 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 7.00 \times 10^4$ n = 7.3 years 7 years Model No. 11 AC (4 cm) Pavement Design Subgrade CBR = 8.0% (MR =  $1,500 \times CBR = 12,000 \text{ psi}$ ) Pavement Structure and SN Layer Materials tı(cm) аı M 1 t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Surface 1.56 AC 4 0.20 -1.458 12Base Crushed Stone 0.14 0.9 Sandy Gravel 8 0.10 0.9 0.72 Subbase 24 cm SN = 3.738/2.54 = 1.472Predicted number of ESAL w: for SN = 1.472, MR = 12,000 psi and  $p_t = 2.01.5$  $W = 7.31 \times 10^4$ n : Predicted performance period for initial year ESAL =  $8.27 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 7.31 \times 10^4$ n = 7.6 years

8

years

8-6 (7)

Model No. 12 AC (5 cm) Pavement Design Subgrade CBR = 8.0% (MR =  $1,500 \times CBR = 12,000 \text{ psi}$ ) Pavement Structure and SN Materials t<sub>1</sub>(em) aı Mi. t<sub>1</sub> x a<sub>1</sub> x m<sub>1</sub> Layer 1.95 Surface SBST 0.39 ---5 Base Crushed Stone 12 0.135 0.9 1.458 Sandy Gravel 0.10 0.54 Subbase 6 0.9 23 cm SN = 3.948/2.54 = 1.554Predicted number of ESAL w: for SN = 1.554, MR = 12,000 psi and  $p_{\pm} = 2.0$  W = 9.90 x 10<sup>4</sup> n : Predicted performance period for initial year ESAL =  $8.72 \times 10^3$ , traffic growth rate 3.0% p.a. and W =  $9.90 \times 10^4$  n = n = 9.9 years 9 years Model No. 13 DBST Pavement • Design Subgrade CBR = 8.0% (MR =  $1,500 \times CBR = 12,000 \text{ psi}$ ) Pavement Structure and SN Materials t<sub>i</sub>(cm) t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Layer aı Mi 0.25 SBST 0.375 Surface 1.5 -Crushed Stone 0.135 0.9 1.822 Base 15 Subbase Sandy Gravel 130.10 0.9 1.17 29.5 cm SN = 3.3675/2.54 = 1.326Predicted number of ESAL w: for SN = 1.326, MR = 12,000 psi and  $p_t = 1.5$  $W = 4.22 \times 10^4$ n : Predicted performance period for initial year ESAL =  $8.27 \times 10^3$ , traffic growth rate 3.0% p.a. and W =  $4.22 \times 10^4$  n = n = 4.6 years 5 years Model No. 14 BMP Pavement Design Subgrade CBR = 5.0% (MR =  $1,500 \times CBR = 7,500 \text{ psi}$ ) Pavement Structure and SN t<sub>i</sub> (cm) Layer Materials t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub>  $a_1$ m 1 Surface SBST 0.25 1.250 5 ----1.8225Base Crushed Stone 15 0.135 0.9 Subbase Sandy Gravel 160.10 0.9 1.44 36 cm SN = 4.425/2.54 = 1.742Predicted number of ESAL w: for SN = 1.742, MR = 7,500 psi and  $p_t = 1.5$  W = 6.61 x 10<sup>4</sup> n : Predicted performance period for initial year ESAL =  $8.27 \times 10^3$ , traffic growth rate 3.0% p.a. and W =  $6.61 \times 10^4$  n = n = 6.9 years 7 years

Model No. 15 AC (4 cm) Pavement Design Subgrade CBR = 3.0% (MR =  $1,500 \times CBR$  = 4,500 psi) Pavement Structure and SN Layer Materials tı(cm) ai m 1 t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Surface SBST 4 0.39 1.56 Base Crushed Stone 150.135 0.9 1.8225 Subbase Sandy Gravel 23 0.10 0.9 2.07 42 cm SN = 5.4525/2.54 = 2.147Predicted number of ESAL w: for SN = 2.147, MR = 4,500 psi and  $p_t = 2.0$  $W = 6.89 \times 10^4$ n : Predicted performance period. for initial year ESAL =  $8.72 \times 10^3$ , traffic growth rate 3.0% p.a. and  $W = 6.89 \times 10^4$ n = 7.2 years 7 years Model No. 16 AC (5 cm) Pavement Design Subgrade CBR = 3.0% (MR = 1,500 x CBR = 4,500 psi) Pavement Structure and SN Layer Materials ti(cm) aı t<sub>i</sub> x a<sub>i</sub> x m<sub>i</sub> Ш і Surface SBST 5 0.39 ----1.95 150.135 0.9 1.8225 Crushed Stone Base 0.10 1.89 21 0.9 Subbase Sandy Gravel SN = 5.6625/2.54 = 2.22941 cm Predicted number of ESAL w: for SN = 2.229, MR = 4,500 psi and  $p_{\pm} = 2.0$  $W = 8.70 \times 10^4$ n : Predicted performance period , traffic growth for initial year ESAL =  $8.72 \times 10^3$ rate 3.0% p.a. and  $W = 8.70 \times 10^4$ n = 8.9 years 9 years Section No. 5 ESAL at initial year = Number of Heavy Vehicles / day-direction x Vehicle Load Factor x 365 =  $[137(Truck) \times 1.233 + 59(Bus) \times 0.613 \times 365 = 74,857$ Model No. 17 AC (5 cm) Pavement Design Subgrade CBR = 5.0% (MR =  $1,500 \times CBR = 7,500 \text{ psi}$ ) In order to investigate the serviceability of medium-traffic, type 5 cm AC with 15 cm Base Course pavement with in the 5 years follow-up survey period, the accelerated procedure for of accumulation of this heavy traffic of this road was planned. Following AC pavement structure was designed. AC 5 cm, Base 15 cm, Subbase 15 cm

8-6 (9)

The predicted performance period (up to terminal serviceability index pt = 2.0 level) is 3 years.

Pavement Layer Surface Base Subbase	Structure and SN Materials SBST Crushed Stone Sandy Gravel	t <sub>1</sub> (cm) 5 15 19	a <u>.</u> 0.39 0.135 0.10	m <sub>1</sub> 0.9 0.9	t, x a, x m, 1.95 1.8225 1.71
		39 cm	SN =	5.482	25/2.54 = 2.158
	icted number of ESAL SN = 2.158 MR = 7,500	0 psi and	$p_{t} = 2$ .	0, W	$= 2.33 \times 10^8$

n : Predicted performance period for initial year ESAL = 7.48 x 10<sup>4</sup>, traffic growth rate 3.0% p.a. and W = 2.33 x 10<sup>5</sup> n = 2.8 years 3 years

This pavement structure has the predicted performance period of 10 to 12 years if applied for medium-traffic condition such as shown in Table A.

TABLE A.PREDICTED PERFORMANCE PERIOD OF MODEL NO. 17 PAVEMENT,<br/>AC 5 CM. BASE 15 CM, SUBBASE 19 CM, SUBGRADE CBR = 5%

	· · · · · · · · · · · · · · · · · · ·	
Road and	Performance	Cumulative
Traffic	Period	Number of ESAL
Application	(pt = 2.0)	
This road section		
Heavy-traffic		·
Number of heavy vehicles		_
196/day-direction	3 years	$2.33 \times 10^8$
(Truck 137, Bus 59)		
Vehicle Load Factor		Traffic growth
average = 1.051		rate 5% p.a.
Medium-traffic road		
Number of heavy vehicles		· _
55/day-direction	10 years	$2.30 \times 10^{8}$
45/day-direction	12 years	2.33 x 10 <sup>8</sup>
Vehicle Load Factor = 1.0		Traffic growth
		rate 3% p.a.

Structural Design of Portland Cement Concrete Pavement Model No. 18 PCC (18 cm) Pavement Design Subgrade CBR = 5.0% To investigate the service performance of medium-traffic type 18 cm PCC pavement within 5 years of follow-up survey period, the accelerated procedure for accumulating heavy traffic of this road was planned and the following pavement structure was designed. PCC 18 cm. Subbase 20 cm the predicted performance period (up to terminal serviceability index pt = 2.0 level) is 8 years. Predicted W was computed from AASHTO Basic Design Equation for Rigid Pavements (1986) from the following design data. = 7.56 x  $10^{5}$  (up to  $p_{t} = 2.0$ ) W = 7.9 years (predicted performance period for traffic n = 8 years growth rate 5.0%) D = PCC Slab thickness : 7.087 in (18 cm) = 2.0pt  $\Delta psi = 4.2 - pt = 2.2$ Sc = Modulus of rupture for PCC : 580 psi

E = Modulus of elasticity for PCC : 3.28 x 10<sup>6</sup> psi = Joint load transfer coefficient : 4.2 J Cd = Drainage coefficient : 0.9 k = Modulus subgrade reaction for Subgrade CBR = 5% and 20 cm : 170 pci Subbase = Standard normal deviate ZR = Combined standard error of the traffic prediction and So performance prediction

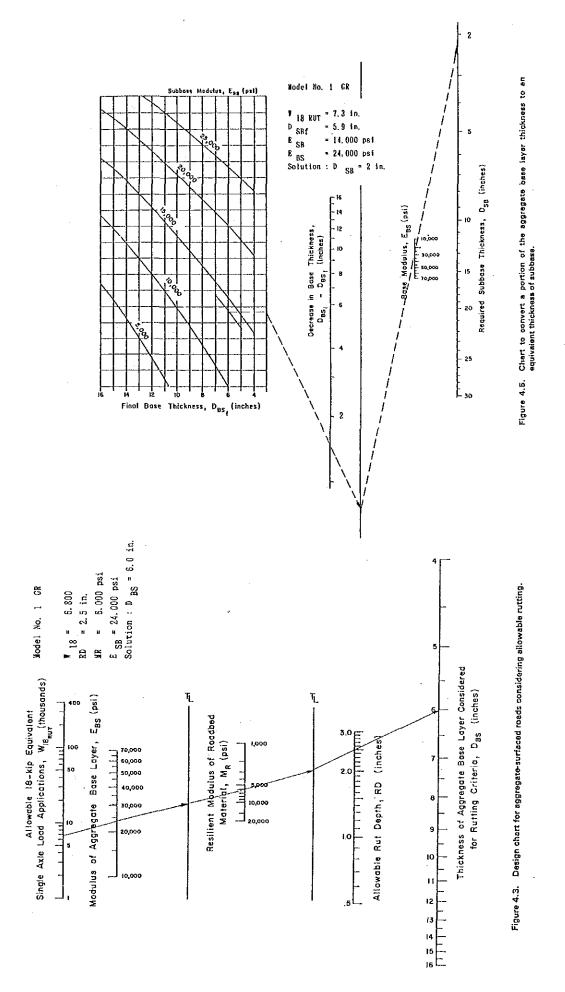
 $Z_R \times So = 0$ This pavement structure has the predicted performance period of 15 to 20 years if applied for medium-traffic condition such as

shown in Table B.

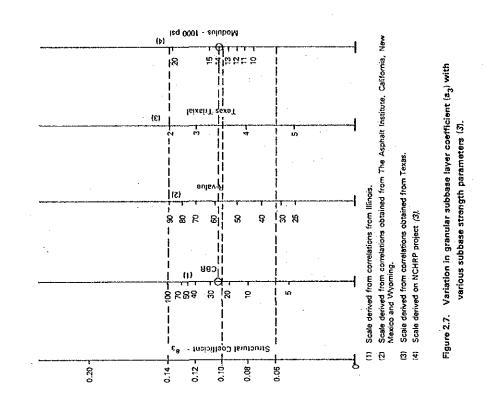
Road and Traffic Application	Performance Period (pt = 2.0)	Cumulative Number of ESAI
This road section Heavy-traffic Number of heavy vehicles 196/day-direction Vehicle Load Factor average = 1.120	8 years	7.56 x 10 <sup>8</sup> Traffic growth rate 5% p.a.
Medium-traffic road Number of heavy vehicles		
120/day-direction	15 years	8.1 x 10 <sup>5</sup>
95/day-direction	18 years	8.1 x 10 <sup>5</sup>
80/day-direction	20 years	7.8 x 10 <sup>5</sup>
Vehicle Load Factor = 1.0		Traffic growth rate 3% p.a.

TABLE B.PREDICTED PERFORMANCE PERIOD OF MODEL NO. 18 PAVEMENT,PCC18 CM, SUBBASE 20 CM, SUBGRADE CBR = 5%

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8 - 6 (13)



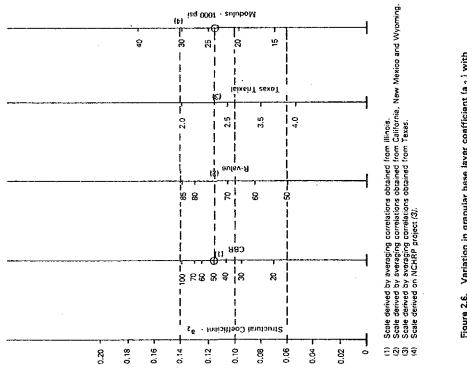


Figure 2.6. Variation in granular base layer coafficient (a  $_2$  ) with various base atrength parameters (3).

8-6 (14)

### Determination of Design Subgrade CBR Value

The Subgrade CBR Values are calculated according to the following formula: Design CBR Value = mean value of individual CBR Value - Standard Deviation = x - o Section No. 1 For the whole length of 800 m section, the following CBR test values are obtained to determine the design subgrade CBR value. No. 2 No. 4 No. 6 No. 7 No. 8 Boring No. CBR test value (%) 5 3 7 6 5 Using the above CBR test results, the following values were computed, n = 5,  $\bar{x} = 5.2$ ,  $\sigma = 1.32$ ,  $\bar{x} = -\sigma = 3.88$ Then, Design CBR = 4.0%Section No. 2 For the whole length of 800 m section, the following CBR test values are obtained to determine the design subgrade CBR value. No. 6 No. 7 No. 7 2 No. 4 No. 8 Boring No. No. 3 2 10 10 11 CBR test value (%) 4 Using the above CBR test results, the following values were computed, n = 6  $\overline{x} = 6.7$   $\sigma = 3.72$   $\overline{x}$  $-\sigma = 2.98$ Then, Design CBR = 3.0%

### Determination of Design Subgrade CBR Value

Sections No. 3 and 4

1) For the first 400 m length, (Sta. 0 + 000 to Sta. 0 + 400 of Section No. 3), the following CBR test values were obtained to determine the design subgrade CBR value.

(Section No. 3)           Boring No.         No. 1         No. 2         No. 3         No. 4           CBR test value (%)         3         8         4         4
Using the above CBR test results, the following values were computed, $n = 4$ $\bar{x} = 4.75$ $\sigma = 1.92$ $\bar{x} - \sigma = 2.83$
Then, Design CBR = 3.0%
<ol> <li>For the next 600 m , (Sta. 0 + 400 to Sta. 0 + 800 of Section No. 3), the following CBR test values were obtained to determine the design subgrade CBR value.</li> </ol>
(Section No. 3)       (Section No. 4)         Boring No.       No. 5       No. 6       No. 1       No. 2         CBR test value (%)       10       7       12       11
Using the above CBR test results, the following values were computed, $n = 4$ $\bar{x} = 9.75 \sigma = 1.79$ $\bar{x} = -\sigma = 7.96$
Then, Design CBR = 8.0%
3) And for the next 200 m , (Sta. 0 + 200 to Sta. 0 + 400 of Section No. 4), the following CBR test values were obtained to determine the design subgrade CBR value.
(Section No. 4)Boring No.No. 3 No. 4CBR test value (%)8 5
Using the above CBR test results, the following values were computed, $n = 2$ $\ddot{x} = 6.50$ $\sigma = 1.50$ $\ddot{x} - \sigma = 5.0$

Then, Design CBR = 5.0%

Determination of Design Subgrade CBR Value

Sections No. 3 and 4

 For the last 400 m length, (Sta. 0 + 400 to Sta. 0 + 800 of Section No. 4), the following CBR test values were obtained to determine the design subgrade CBR value.

 (Section No. 4)

 Boring No.
 No. 5 No. 7 No. 8

 CBR test value (%)
 3 5 5 5

From the above CBR test results, the following values were computed, n = 3  $\overline{x} = 4.33$   $\sigma = 0.94$   $\overline{x} - \sigma = 3.39$ 

Then, Design CBR = 3.0%

Section No. 5

For the whole length of 400 m section, the following CBR test values were obtained to determine the design subgrade CBR value.

 Boring No.
 No. 1
 No. 3
 No. 4

 CBR test value (%)
 4
 7
 8

From the above CBR test results, the following values were computed, n = 3  $\overline{x} = 6.33$   $\sigma = 1.70$   $\overline{x} - \sigma = 4.63$ 

Then, Design CBR = 5.0%

# Appendix 8–7

# COST FOR

# EXPERIMENTAL PAVEMENT CONSTRUCTION

# Summary of Unit Price Analysis

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: Pay :Item No.		: Unit	: Unit : Price
: 102(2)		: P/m^3	
: 102(5) :	: :Surplus Excavation of Existing Pavement, :Section 3 and 4	: : P/m^3	71.96
102(6)	Surplus Excavation of Existing Pavement, Section 5	₽/m^3	71.96
: 104(3)	: Selection Borrow for Topping, Case 2	: P/m^3	101.40
: 104(5) :	: :Embankment for Shoulder w/ Materials Obtained :from Excavation of Existing Pavement	: : P/m^3	54.98
: 105	Subgrade Preparation	P/m^2:	5.33
: : 108	: Re-Shaping of Existing Shoulder	P/m^2	5.31
: : 200	: :Aggregate Sub-Base Course	P/m^3	: 306.04
: : 202	: :Crushed Aggregate Base Course	₽/m^3	437.53
: : 300(2)	: Crushed Aggregate Surface Course	P/m^3:	443.78
: : 301(1)	: Bit. Prime Coat, MC-70 Cut-Back Asphalt	P/MT	11479.18
: : 303(1)	: :Bituminous Seal Coat, Aggregate Type 2	P/MT	416.14
: : 303(2)	: Bit. Seal Coat, MC-800 Cut-Back Asphalt	P/MT	11050,28
: : 304(1)a	: :Bit. Surface Treatment, Aggregate Grading A	P/MT	626.68
: : 304(1)b	: :Bit. Surface Treatment, Aggregate Grading B :	: P/MT :	626,68
: : 304(4)	: :Bit.Surface Treatment,MC-800 Cut-Back Asphalt:	P/MT	11168.79
: ; 305(1)	: Aggregate for Bit. Penetration Macadam	P/MT	565.85
: : 305(3) :	: :MC-BOO Cut-Back Asphalt for Bituminous :Penetration Macadam Pavement	P/MT	11376.12
: 310	: :Bít. Concrete Surface Course, Hot Laid :	P/MT	1666.23
	: :Portland Cement Concrete Surface, :Plain (t = 18 cm.)	P7M^2	347.50
: 504	: :Grouted Riprap Side Ditch	P/LM.	618.77

8-7 (1)

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### UNIT PRICE ANALYSIS

Pay Item No. 102(2) Surplus Common Excavations

~	<b>—</b>		Unit	<u> </u>
Α.	Equipment	Unit	Rate	Amount
	1 - Bulldozer,140 Hp	P/hr.	786.17	786.17
	0.5 - Wheel Loader,100 Hp	P/hr.	436.97	218.49
	1 - Dump Truck,100 Hp	P/hr.	174.96	174.96
	Total A	P/hr.		1179.62
	-			
в.	Labor			
	1 - Foreman	P/hr.	22.44	22.44
	1.5 - H.E. Optr.	P/hr.	15.55	23.33
	1 - Driver	P/hr.	14.30	14.30
	5 - Unskilled Laborer	P/hr.	13.82	55,28
	<i></i>			
	Total B	P/hr.		115.35
	Total A + B	P/hr.		1294.96
с.	Output: 30 m^3/hr.			
υ.	1294.96/30	P/m^3		43.17
D.	VAT 10% of A & B	P/m^3		4.32
Ε.	Overhead and Profit, 25%	P/m^3		10.79
F.	Unit Price	P/m^3		58.27

# 8-7 (3)

			Unit	
Α.	Equipment	Unit	Rate	Amount
	1 – Pavement Breaker,5 Hp	P/hr.	47.91	47.91
	0.5 - Wheel Loader,100 Hp	P/hr.	436.97	218.49
	1 - Dump Truck,100 Hp	P/hr.	174.96	174.96
		•••		
	Total A	P/hr.		441.36
в.	Labor			
	1 - Foreman	P/hr.	22.44	22.44
	1.5 - H.E. Optr.	P/hr.	15.55	23.33
	1 - Driver	P/hr.	14.30	14.30
	10 - Unskilled Laborer	P/hr.	13.82	138.20
	Total B	P/hr.		198.27
	Total A + B	P/hr.		639.62
С.	Output: 12 m^3/hr.			
	639.62/12	P/m^3		53.30
D.		D ( ~ ^ 7		E 77
	VAT 10% of A & B	P/m^3		5.33
Е. F.	Overhead and Profit, 25% Unit Price	P/m^3		13.33
г.		₽/m^3		71.96

Pay Item No. 102(5) Surplus Excavation (Existing Pavement) Section 3 and 4

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0			Unit	
Α.	Equipment	Unit	Rate	Amount
	1 - Pavement Breaker,5 Hp	P/hr.	47.91	47.91
	0.5 - Wheel Loader,100 Hp	P/hr.	436.97	218.49
	1 - Dump Truck,100 Hp	P/hr.	174.96	174.96
	Total A	P/hr.		441.36
	IUCAI M	1 7 111 •		111100
В.	Labor			
	1 - Foreman	P/hr.	22,44	22.44
	1.5 - H.E. Optr.	P/hr.	15.55	23.33
	1 - Driver	P/hr.	14.30	14.30
	10 – Unskilled Laborer	P/hr.	13.82	138.20
		P/hr.		198.27
	Total B Total A + B	P/nr. P/hr.		639.62
		F7117 •		037.02
с.	Output: 12 m^3/hr.	₽/ጠ^3		53.30
	639.62/12	F711 J		55,50
	VAT 10% of A & B	P/m^3		5.33
ε.	Overhead and Profit, 25%	P/m^3		13.33
F.	Unit Price	P/m^3		71.96

### Pay Item No. 102(6) Surplus Excavation (Existing Pavement) Section 5

Pay Item No. 104(3) Selection Borrow for Topping, Case 2

A.	Equipment	Unit	Unit Rate	Amount
FG .	Equipment	UNIC	Nate	milijuuri c
	1 – Motor Grader,125 Hp	P/hr,	518.65	518.65
	1 - Wheel Loader,100 Hp	P/hr.	436.97	436.97
	1 - Pneumatic Roller,85 Hp	P/hr.	322 86	322.86
	0.5 - Water Truck,120 Hp	P/hr.	246.05	123.03
	1 - Vibro. Drum Roller,125 Hp	P/hr.	440.54	440.54
	2 - Dump Truck, 100 Hp	P/hr.	174.96	349.92
	1 - Bulldozer	P/hr.	786.17	786.17
	Total A	P∕hr.		2978.14
в.	Labor			
	1 - Foreman	P/hr.	22.44	22.44
	4 - H.E. Optr.	P/hr.	15.55	62.20
	1 - L.E. Optr.	P/hr.	14.86	14.86
	2.5 - Driver	P/hr.	14.30	35.75
	2 - Skilled Laborer	P/hr.	14.30	28.60
	6 - Unskilled Laborer	P/hr.	13,82	82.92
	Total B	P/hr.		246.77
	Total A + B	P/hr.		3224.91
с.	Output: 50 m^3/hr.			
	3224.91/50	P/m^3		64.50
_				
D.	Materials			
	Cost at Quarry	P/m^3		14.33
D.		P/m^3		6.45
Ε.	Overhead and Profit, 25%	₽∕m^3		16.12
F.	Unit Price	P/m^3		101.40

Pay Item No. 104(5) Embankment (Construction of Shoulder Using Existing Pavement Material)

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		. • 	Unit	<b>.</b> .
Α.	Equipment	Unit	Rate	Amount
	1 - Motor Grader,125 Hp	P/hr.	518,65	518.65
	0.5 - Wheel Loader,100 Hp	P/hr.	436.97	218.49
	1 - Pneumatic Roller,85 Hp	₽/hr.	322.86	322.86
	0.5 - Water Truck,120 Hp	P/hr.	246.05	123.03
	1 - Vibro. Drum Roller,125 Hp	P/hr.	440.54	440.54
	1 - Dump Truck,100 Hp	P/hr.	174.96	174.96
	Total A	P/hr.		1623.56
в.	Labor			
	1 - Foreman	P/hr.	22.44	22.44
	2.5 - H.E. Optr.	P/hr.	15.55	38.88
	1 - L.E. Optr.	P/hr.	14.86	14.86
	1.5 - Driver	P/hr.	14.30	21.45
	2 - Skilled Laborer	P/hr.	14.30	28.60
	6 - Unskilled Laborer	P/hr.	13.82	82.92
	Total B	P/hr.		209.15
	Total A + B	P/hr.		1832.71
с.	Output: 45 m^3/hr.			
	1832.71/45	P∕m^3		40.73
D.	VAT 10% of A & B	P∕m^3		4.07
Ε.	Overhead and Profit, 25%	P/m^3		10.18
F.	Unit Price	P/m^3		54.98

Pay Item No. 105 Subgrade Preparation

Α.	Equipment	Unit	Unit Rate	Amount
	1 – Motor Grader,125 Hp 0.5 – Pneumatic Roller,85 Hp 0.5 – Water Truck,120 Hp 0.5 – Vibro. Drum Roller,125 Hp	P/hr. P/hr. P/hr. P/hr.	518.65 322.86 246.05 440.54	518.65 161.43 123.03 220.27
	Total A	P/hr.		1023.38
в.	Labor			
	1 - Foreman 1.5 - H.E. Optr. 0.5 - L.E. Optr. 0.5 - Driver 1 - Skilled Laborer 2 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 23.33 7.43 7.15 14.30 27.64
	Total B Total A + B	P/hr. P/hr.		102.29 1125.66
С.	Output: 285 m^2/hr. 1125.66/285	P/m^2		3.95
	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/m^2 P/m^2 P/m^2		0.39 0.99 5.33

. . Pay Item No. 108 Re-Shaping of Existing Shoulder

A.	Equipment	Unit	Unit Rate	Amount
	1 – Motor Grader,125 Hp 0.5 – Pneumatic Roller,85 Hp 0.5 – Water Truck,120 Hp 0.5 – Vibro. Drum Roller,125 Hp	P/hr. P/hr. P/hr. P/hr.	518.65 322.86 246.05 440.54	518.65 161.43 123.03 220.27
	Total A	P/hr.		1023.38
в.	Labor			
	1 - Foreman 1.5 - H.E. Optr. 0.5 - L.E. Optr. 0.5 - Driver 1 - Skilled Laborer 4 - Unskilled Laborer Total B Total A + B	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 23.33 7.43 7.15 14.30 82.92 157.57 1180.94
c.	Output: 300 m^2/hr. 1180.94/300	ዮ/m^2		3.94
ε.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	₽/m^2 ₽/m^2 ₽/m^2		0.39 0.98 5.31

Pay Item No. 200 Aggregate Sub-Base Course

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Α.	Equipment	Unit	Unit Rate	Amount
	<ol> <li>Motor Grader,125 Hp</li> <li>Pneumatic Roller,85 Hp</li> <li>Water Truck,120 Hp</li> <li>Vibro. Drum Roller,125 Hp</li> </ol>	P/hr P/hr P/hr P/hr	518.65 322.86 246.05 368.29	518.65 968.58 246.05 368.29
	Total A	₽/hr.		2101.57
в.	Labor			
	1 - Foreman 3 - H.E. Optr. 3 - L.E. Optr. 1 - Driver 1 - Skilled Laborer 4 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 46.65 44.58 14.30 14.30 55.28
	Total B Total A + B	P∕hr. P∕hr.		197.55 2299.12
c.	Dutput; 100 m^3/hr. 2299,12/100	P/m^3		22.99
D.	Materials Qty. Unit Cost Coarse Aggregate 1 275	P/m^3		275.00
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	₽/m^3 ₽/m^3 ₽/m^3		2.30 5.75 306.04

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Pay Item No. 202 Crushed Aggregate Base Course

А.	Equipment	Unit	Unit Rate	Amount
	<ol> <li>Motor Grader,125 Hp</li> <li>Pneumatic Roller,85 Hp</li> <li>Water Truck,120 Hp</li> <li>Vibro. Tandem Roller,68 Hp</li> </ol>	P/hr. P/hr. P/hr. P/hr.	518.65 322.86 246.05 368.29	518.65 645.72 246.05 368.29
	Total A	₽/hr.		1778.71
в.	Labor			
•	<pre>1 - Foreman 2 - H.E. Optr. 2 - L.E. Optr. 1 - Driver 2 - Skilled Laborer 4 - Unskilled Laborer Total B Total A + B</pre>	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 31.10 29.72 14.30 14.30 55.28 167.14 1945.85
с.	Output: 70 m^3/hr. 1945.85/70	₽/m^3		27.80
D.	Materials Qty, Unit Cost Crushed Aggregate 1 400	₽/m^3	•	400.00
E. F. G.		₽/m^3 ₽/m^3 ₽/m^3		2.78 6.95 437.53

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Α.	Equipment	Unit	Unit Rate	Amount
	<ol> <li>Motor Grader,125 Hp</li> <li>Pneumatic Roller,85 Hp</li> <li>Water Truck,120 Hp</li> <li>Vibro. Tandem Roller,68.Hp</li> </ol>	P/hr. P/hr. P/hr. P/hr.	518.65 322.86 246.05 368.29	518.65 645.72 246.05 368.29
	Total A	P/hr.		1778.71
В.	Labor			
	1 - Foreman 2 - H.E. Optr. 2 - L.E. Optr. 1 - Driver 1 - Skilled Laborer 4 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 31.10 29.72 14.30 14.30 55.28
	Total B Total A + B	P/hr. P/hr.		167.14 1945.85
c.	Output: 60 m^3/hr. 1945.85/60	P/m^3		32.43
D.	Materials Qty. Unit Cost Coarse Aggregate 1 400	₽/m^3		400.00
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	₽/m^3 ₽/m^3 ₽/m^3		3.24 8.11 443.78

Pay Item No. 300(2) Crushed Aggregate Surface Course

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Pay Item No. 301(1) Bituminous Prime Coat, MC-70 Cut-Back Asphalt

Α.	Equipment	Unit	Unit Rate	Amount
	1 - Asphalt Distributor,100 Hp 0.5 - Power Broom,Towed,90 Hp 0.5 - Water Truck,120 Hp 0.5 - Pick-Up,70 Hp	P/hr. P/hr. P/hr. P/hr.	338.55 135.64 246.05 111.77	338.55 67.82 123.03 55.89
	Total A			585.28
в.	Labor			
	1 - Foreman 1 - H.E. Optr. 0.5 - L.E. Optr. 1 - Driver 1 - Skilled Laborer 5 - Unskilled Laborer Total B Total A + B	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 15.55 7.43 14.30 14.30 69.10 143.12 728.40
с.	Output: 0.80 Ton/hr. 728.40/0.80	P/ton		910.50
D.	Materials Qty. Unit Cost Cut-Back Asphalt 1 10250 (MC-70)	P/ton		10250.00
E. F. G.				91.05 227.63 11479.18

Α.	Equipment	Unit	Unit Rate	Amount
	1 – Aggregate Spreader,140 Hp 1 – Vibro. Tandem Roller,68 Hp	P/hr. P/hr.	169.80 368.29	169.80 368,29
	Total A	P/hr.		538.09
в.	Labor			
	1 - Foreman 1 - H.E. Optr. 1 - L.E. Optr. 2 - Skilled Laborer 10 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 13.82	22.44 15.55 14.86 28.60 138.20
	Total B Total A + B	P/hr. P/hr.		219.65 757.74
с.	Output: 7.0 Tons/hr. 757.74/7	P/ton		108.25

D.		Qty. 1		P/ton	270.00
F.	VAT 10% of A & B Overhead and Pro Unit Price		5%	P/ton P/ton P/ton	10.82 27.06 416.14

Pay Item No. 303(1) Bituminous Seal Coat, Aggregate Type 2

А.	Equipment	Unit	Unit Rate	Amount
	1 - Asphalt Distributor,100 Hp	P/hr.	338.55	338.55
	Total A	P/hr.		338.55
в.	Labor			
	1 - Foreman 1 - H.E. Optr. 2 - Skilled Laborer 4 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.30 13.82	22.44 15.55 28.60 69.10
	Total B Total A + B	P/hr. P/hr.		135.69 474.24
. C.	Output: 0.80 Ton/hr. 474.24/0.80	P/ton		592.80
D.	Materials Qty. Unit Cost Cut-Back Asphalt 1 10250	P/ton		10250.00
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		59.28 148.20 11050.28

Pay Item No. 303(2) Bituminous Seal Coat, MC-800 Cut-Back Asphalt

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Aggregate Grading A						
Α.	Equipment	Unit	Unit Rate	Amount		
	1 – Aggregate Spreader,140 Hp 1 – Vibro. Tandem Roller,68 Hp 0.5 – Pneumatic Roller,85 Hp	P/hr. P/hr. P/hr.	169.80 368.29 322.86	169.80 368.29 161.43		
	Total A	P/hr.		699.52		
в.	Labor					
	1 - Foreman 1 - H.E. Optr. 1.5 - L.E. Optr. 1 - Skilled Laborer 10 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 13.82	22.44 15.55 22.29 14.30 138.20		
	Total B Total A + B	P∕hr. P∕hr.		212.78 912.30		
с.	Output: 8 Tons/hr. 912.30/8	P/ton		114.04		
D.	Materials Qty. Unit Cost Coarse Aggregate 0.97 479 Fine Aggregate 0.03 270	P/ton P/ton		464.63 8.10		
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		11.40 28.51 626.68		

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# Pay Item No. 304(1)a Bituminous Surface Treatment,

Aggregate Grading B							
А.	Equipment	Unit	Unit Rate	Amount			
	1 – Aggregate Spreader,140 Hp 1 – Vibro. Tandem Roller,68 Hp 0.5 – Pneumatic Roller,85 Hp	P/hr. P/hr. P/hr.	169.80 368.29 322.86	169.80 368.29 161.43			
	Total A	P/hr.		699,52			
в.	Labor						
	1 - Foreman 1 - H.E. Optr. 1.5 - L.E. Optr. 1 - Skilled Laborer 10 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 13.82	22.44 15.55 22.29 14.30 138.20			
	Total B Total A + B	P∕hr. P∕hr.		212.78 912.30			
С.	Output: 8 Tons/hr. 912.30/8	P/ton		114.04			
D.	Materials Qty. Unit Cost Coarse Aggregate 0.97 479 Fine Aggregate 0.03 270	P/ton P/ton		464.63 8.10			
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		11.40 28.51 626.68			

## Pay Item No. 304(1)b Bituminous Surface Treatment, Aggregate Grading B

HC-600 Lut-Back Asphart							
Α.	Equipment	Unit	Unit Rate	Amount			
	1 - Asphalt Distributor,100 Hp 0.5 - Power Broom,Towed,90 Hp 0.5 - Pick-Up,70 Hp	P/hr. P/hr. P/hr.	338.55 135.64 111.77	338,55 67,82 55,89			
	Total A	P/hr.		462.26			
в.	Labor	-		· .			
	1 - H.E. Optr.	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 15.55 7.43 7.15 28.60 69.10			
	Total B Total A + B	P/hr. P/hr.		150.27 612.53			
с.	Output: 0.9 Ton/hr. 612.53/0.9	P/ton		680.58			
D.	Materials Qty. Unit Cost Cut-Back Asphalt 1. 10250 MC-800	P/ton		10250.00			
	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		68.06 170.15 11168.79			

## Pay Item No. 304(4) Bituminous Surface Treatment, MC-800 Cut-Back Asphalt

Α.	Equipment	Unit	Unit Rate	Amount
	1 – Aggregate Spreader,140 Hp 1 – Vibro. Tandem Roller,68 Hp 1 – Pneumatic Roller,85 Hp	P∕hr. P∕hr. ₽∕hr.	169.80 368.29 322.86	169.80 368.29 322.86
	Total A	P∕hr.		860.95
В.	Labor			
	1 - Foreman 1 - H.E. Optr. 2 - L.E. Optr. 1 - Skilled Laborer 10 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 13.82	22.44 15.55 29.72 14.30 138.20
	Total B Total A + B	P/hr. P/hr.		220.21 1081.16
с.	Output: 15 Tons/hr. 1081.16/15	P/ton-		72.08
D.	Materials Qty. Unit Cost Coarse Aggregate 0.95 479 Fine Aggregate 0.05 270	P/ton P/ton P/ton		455.05 13.50
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		7.21 18.02 565.85

Pay Item No. 305(1) Aggregate for Bituminous Pen. Macadam

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Pay	Item	Nơ.	305(3)	MC-800 Cut-Back Asphalt for Bituminous Penetration Macadam Pavement	

A.	Equipment	Unit	Unit Rate	Amount
		P/hr. P/hr. P/hr.	338.55 135.64 111.77	338.55 67.82 55.89
	Total A	P/hr.		462.26
в.	Labor			
	1 - Foreman 1 - H.E. Optr. 0.5 - L.E. Optr. 0.5 - Driver 1 - Skilled Laborer 5 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.66 14.30 14.30 13.82	$22.44 \\ 15.55 \\ 7.43 \\ 7.15 \\ 14.30 \\ 138.20$
	Total B Total A + B	P/hr. P/hr.		205.07 667.33
С.	Dutput: 0.80 Ton/hr. 667.33/0.8	P/ton		834.16
D.	Materials Qty. Unit Cost MC-800 Asphalt 1 10250	P/ton		10250.00
E. F. G.		P/ton P/ton P/ton		83.42 208.54 11376.12

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Pay Item No. 310 Bituminous Concrete Surface Course, Hot Laid

Α.	Equipment	Unit	Unit Rate	Amount
	<ol> <li>Asphalt Paver,130 Hp</li> <li>Vibro. Tandem Roller,68 Hp</li> <li>Pneumatic Roller,85 Hp</li> <li>Dump Trucks,100 Hp</li> </ol>	P/hr. P/hr. P/hr. P/hr.	819.15 368.29 322.86 174.96	819.15 368.29 645.72 699.84
	Total A	P/hr.		2533.00
в.	Labor			
	1 - Foreman 2 - H.E. Optr. 2 - L.E. Optr. 4 - Driver 5 - Skilled Laborer 10 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 15.55 14.86 14.30 14.30 13.82	22.44 31.10 29.72 57.20 71.50 138.20
	Total B Total A + B	₽/hr. ₽/hr.		350.16 2883.16
С.	Output: 10 Tons/hr. 2883.16/10	P/ton		288,32
D.	Materials Qty. Unit Cost Bit. Conc. Mixed .1 1277	P/ton		1277.00
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/ton P/ton P/ton		28.83 72.08 1666.23

8 - 7 (21)

Pay	Item No. 311(1) Portland Cement Plain (t = 18 cm		Surface,	
Α.	Equipment	Unit	Unit Rate	Amount
	<ol> <li>Conc. Batching Plant,75 Hp</li> <li>Wheel Loader,100 Hp</li> <li>Transit Mixers,200 Hp</li> <li>Water Truck,120 Hp</li> <li>Concrete Cutter,30 Hp</li> <li>Misc. Tools 10% of Above</li> </ol>	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	314.12 436.97 484.02 246.05 69.26	314.12 436.97 1452.06 246.05 69.26 251.85
	Total A	P/hr.		2770.31
в.	Labor			
	1 - Foreman 1 - Asst. Foreman 2 - H.E. Optr. 4 - Driver 15 - Skilled Laborer 25 - Unskilled Laborer	P/hr. P/hr. P/hr. P/hr. P/hr. P/hr.	22.44 18.81 15.55 14.30 14.30 13.82	22.44 18.81 31.10 57.20 214.50 345.50
	Total B Total A + B	P/hr. P/hr.		687.55 3457.86
C.	Output: 100 m^2/hr. 3459.86/100	P/m^2		32.95
D.	MaterialsQty.Unit CostPortland Cement1.72100Rein.Bars0.4020Lumber0.6025C.W.Nails0.00230FineAggregate0.08200CrushedAgg.0.16400Water0.0547.5Incidentals10%of Above	P/m^2 P/m^2 P/m^2 P/m^2 P/m^2 P/m^2 P/m^2 P/m^2		172.00 8.00 15.00 0.06 16.00 64.00 0.41 27.55
E. F. G.	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P/m^2 P/m^2 P/m^2		3.30 8.24 347.50

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Pay Item No. 504 Grouted Riprap Side Ditch

Α.	Equipment	Unit	Unit Rate	Amount
	1 - Minor Tools	P/hr.	21.78	21.78
P	Total A	P/hr.		21.78
в.	Labor 1 - Foreman 4 - Skilled Laborer 10 - Unskilled Laborer	P/hr: P/hr. P/hr.	22.44 14.30 13.82	22.44 57.20 138.20
	Total B Total A + B	P/hr. P/hr.		217.84 239.62
с.	Output: 1.2 lm./hr. 239.62/1.2	P/lm.		199.68
D.	Materials Qty. Unit Cost Riprap 0.38 450 Cement Grout 0.11 1620	P/lm. P/lm.		171.00 178.20
	VAT 10% of A & B Overhead and Profit, 25% Unit Price	P∕1m. ₽∕1m. ₽∕1m.		19.97 49.92 618.77

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8 - 7 (23)

# Construction Cost Estimate

### Section No. 1 to 4

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Pay Item No.	•	: Unit ;	:Estimated :Quantity		Total Price
102(2)	Surplus Common Excavation	: P/a^3	: 3025.00	58.27	176266.75
102(5)	:Surplus Excavation of Existing Pavement, :Section 3 and 4	: : P/n^3	: : 1818.80	71.96	130880.85
104(3)	; :Selection Borrow for Topping, Case 2	1 : P/m^3	: : 595.60	: 101.40	60393.84
104(5)	: :Embankment for Shoulder w/ Materials Obtained :from Excavation of Existing Pavement	: : P/@^3	: : 970.70	54.98	53369.09
105	: Subgrade Preparation	: : P/m^2	: :21522.05	5.33	114712.53
108	: Re-Shaping of Existing Shoulder:	: : P/m^2	: : 337.00	5.31	1789.47
200	: :Aggregate Sub-Base Course	: : P/m^3	: : 2877.87	306.04	880743.33
202	: Crushed Aggregate Base Course	P/a^3	: 2800.10	437.53	1225127.75
300(2)	; :Crushed Aggregate Surface Course	: P/e^3	: 363.28	443.78	161216.40
301(1)	: :Bit. Prime Coat, MC-70 Cut-Back Asphalt	: : P/NT	: 17.18	11479.18	197212.31
303(1)	: :Bituminous Seal Coat, Aggregate Type 2	: : P/ht	: 29,42	416.14	12242.84
303(2)	; :Bit. Seal Coat, MC-BOO Cut-Back Asphalt	: : P/MT	: 3.92	11050.28	43317.10
304(1)a	: a:Bit. Surface Treatment, Aggregate Grading A	: P/NT	: 133.36	626.68	83574.04
304(1)b	; p:Bit. Surface Treatment, Aggregate Grading B	: : P/MT	: 87.14	626.68	54608,90
304(4)	: :Bit.Surface Treatment,MC-800 Cut-Back Asphalt	: P/NT	: 17.80	11168.79	198804.46
305(1)	: Aggregate for Bit. Penetration Macadam	: : P/MT	: : 585.60	565.85	331361.76
305(3)	····· ··· ··· ··· ··· ··· ··· ··· ···	: : P/MT		11376.12	393158.71
310	: :Bit. Concrete Surface Course, Hot Laid	: : P/NT	: 563.03	1666.23	938137.48
504	: :Grouted Riprap Side Ditch	: P/LM	: 1280.00	618.77	792025.60
SP-2	: :Laboratory Improvement and Apparatus	: :Lunp Sum		308000.00	308000.00
SP-3	: :Laboratory Staff	: Lump Sum		100000.00	100000.00
SP-6	: :Vehicles for the Engineer's Staff	: :Lunp Sun		225000.00	225000.00
SP-7	: :Informatory Signs	Each	: 8.00	4500.00	36000.00
SP-8	: :Photographs 	: Each	: 684.00		
2232222	: TOTAL	========== }	:	califi282281	6552143.21

### Construction Cost Estimate

#### Section No. 5

plus Excavation of Existing Pavement, tion No.5 ankment for Shoulder W/ Materials Obtained a Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	: P/@^3 : : P/@^3	:@uantity : 522.50 : : 458.30 : : 2920.00 : : 569.40 : : 225.00 : : 1.34	: 71.96 : : : : : : : : : : : : : : : : : : :	25197.33 15563.60 174259.18 98444.25
tion No.5 ankment for Shoulder #/ Materials Obtained a Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	P/m^3 P/m^3 P/m^3 P/m^3	: 458,30 : 2920.00 : 569,40 : 225,00	: 54.98 : 54.98 : 5.33 : 5.33 : 1 : 306.04 : 1 : 437.53	25197.33 15563.60 174259.18 98444.25
tion No.5 ankment for Shoulder #/ Materials Obtained a Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	P/m^3 P/m^3 P/m^3 P/m^3	: 458,30 : 2920.00 : 569,40 : 225,00	: 54.98 : 54.98 : 5.33 : 5.33 : 1 : 306.04 : 1 : 437.53	25197.33 15563.60 174259.18 98444.25
ankment for Shoulder w/ Materials Obtained æ Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	: P/m^3 : P/m^2 : P/m^3 : P/m^3	: 2920.00 : 569.40 : 225.00	: 5.33 : : 5.33 : : 306.04 : : : : : 437.53 :	15563.60 174259.18 98444.25
© Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	: P/m^3 : P/m^2 : P/m^3 : P/m^3	: 2920.00 : 569.40 : 225.00	: 5.33 : : 5.33 : : 306.04 : : : : : 437.53 :	15563.60 174259.18 98444.25
© Excavation of Existing Pavement grade Preparation regate Sub-Base Course shed Aggregate Base Course	: P/m^3 : P/m^2 : P/m^3 : P/m^3	: 2920.00 : 569.40 : 225.00	: 5.33 : : 5.33 : : 306.04 : : : : : 437.53 :	15563.60 174259.18 98444.25
grade Preparation regate Sub-Base Course shed Aggregate Base Course	: P/m^2 : P/m^3 : P/m^3	: 2920.00 : 569.40 : 225.00	: 5.33 : : 5.33 : : 306.04 : : : : : 437.53 :	15563.60 174259.18 98444.25
regate Sub-Base Course shed Aggregate Base Course	: : P/m^3 : P/m^3	: 569.40 : : 225.00 :	: 306.04 : : 316.04 : : 437.53 : : 437.53 :	174259.18 98444.25
regate Sub-Base Course shed Aggregate Base Course	: : P/m^3 : P/m^3	: 569.40 : : 225.00 :	: 306.04 : : 316.04 : : 437.53 : : 437.53 :	174259.18 98444.25
shed Aggregate Base Course	: P/m^3	: : 225.00 :	: : : : : : : : : : : : : : : : : : :	98444.25
shed Aggregate Base Course	:	: : 225.00 :	: : : : : : : : : : : : : : : : : : :	
	:	:	: :	
	: : P/MT	: : 1,34	: : : 11479.18 :	15382.10
. Prime Coat, MC-70 Cut-Back Asphalt	: P/MT	: 1,34	: 11479.18 :	15382.10
· · · · · · · · · · · · · · · · · · ·	•			
	,	:	: :	
. Concrete Surface Course, Hot Laid	: P/NT	: 167.50	: 1666.23 :	279093.53
	1	:	: :	
tland Cement Concrete Surface,		:	: :	
in (t = 18 cs.)	: P/lm.	: 1340,00	: 347.50 :	465650.00
· ·	:	:	: :	
oratory Apparatus	Lump Sum	: 1,00	:100000.00 :	100000.00
		:	; ;	1
oratory Staff	Luap Sua	: 1.00	; 53000.00 :	53000,00
	:	:	: :	
icles for the Engineer's Staff	Lump Sum	: 1,00	:112500.00 :	112500.00
	1	:	:	
ormatory Signs	: Each	: 2,00	: 4500.00 :	9000.00
	<b>;</b>	1	1 I I	7000 00
tographs	t tach	: 50.00	: 30.00;	3000.00
. твтаі		:	: :	1388687.09
	in (t = 18 cø.) bratory Apparatus bratory Staff icles for the Engineer's Staff	in (t = 18 cm.) : P/lm. coratory Apparatus :Lump Sum coratory Staff :Lump Sum icles for the Engineer's Staff :Lump Sum cormatory Signs : Each tographs : Each	in (t = 18 cm.) : P/1m. : 1340.00 pratory Apparatus :Lump Sum : 1,00 pratory Staff :Lump Sum : 1,00 icles for the Engineer's Staff :Lump Sum : 1,00 : tormatory Signs : Each : 2,00 : tographs : Each : 60.00	in (t = 18 cm.) : P/1m. : 1340.00 : 347.50 : pratory Apparatus :Lump Sum : 1,00 :100000.00 : pratory Staff :Lump Sum : 1,00 : 53000.00 : icles for the Engineer's Staff :Lump Sum : 1,00 :112500.00 : prmatory Signs : Each : 2,00 : 4500.00 : tographs : Each : 60.00 : 50.00 :

## ESTIMATED CONSTRUCTION COST OF EACH PAVEMENT MODEL

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I TEM		SECTION Cerriegaway Wi Langth — 4×	eth m f. ff n	1		SECTION Carriagaway Wé Langth — (×	dth - 8.40 m	n	SECTION NO. 3 Carriaganay Width 6.99 m Langth 4× 209 300m					SECTION Currisgumay Wi Langth = 4×	SECTION No. 1 - 4	SECTION HO 5 CW Width = 8,10 Lungth = 2× 200 = 400cm		m		
	GRAVEL	SUST	DØST	1WF	GRAYEL	SBST	DØST	862	Qast	8¥P	AC (Icm)	AC (5cm)	DBST	8M?	AC (lem)	AC (Scin)	TOTAL	AC (Sen)	700 (11cm)	1
182(2) Surpius Common Excevalion	18, 907, 77	22. 503. D7	24, 384, 42	24, 364, 42	18, 113, 24	21, 382, 61	13, 207, DI	23, 207, 81									112, 868, 15			
182(5) Serplus Excuration of Existing Parament for Section 80, 3 and 4		-							25, 68. DD	25. 689. 00	13, 234, 16	13, 234, 16	18. 181. 18	12. 728. 28	14. <b>141. 1</b> 7	14, 849, 87	139, 880, 85			-
102 (6) Surpius Excurstion of Extisting Pavement for Suction HD, 5																· ·		18, 789, 55	10, 789, 51	-
184(3) Solacted Borrow for Topping. Case 2	7, 695, 14	T. 615. 14	7. 618. 14	7, 615, 14	7, 483, 32	7, 183, 32	7, 483. 32	7, 483, 32									68, 383, 84			_
lå4(5) Enbantment for Sheulder with Weterlafa abtained trop Excavation of Existing Payament									5, 258, 89	5, 258, 85	5, 259, 99	5, 256, 98	8, 886, 18	8, 886, 18	8. 888. 18 	A. 686. 19	53, 369, 99	12, 598, 87		-
188 Re-skaping of Existing Shoulder									319.93	313, 93	318, 83	319, 93	127. 44	127. 44	127. 44	127, 43	1, 789, 87			
185 ([1]) Subgrede Proparation (Common Nutarial)	7, 835, 68	7, 189, 28	7. 189. 26	7, 835. 84	7, 152, 38	7, 1332. 22	7, 431, 57	7, 035, 60	7, 835. 80	7, 035, 60	7, 258, 18	T, 258, 18	7, 935, 88	7, 835, 88	7, 935, 80	- 7, \$18, \$8 				
289 Approprie Subbase Course	20, 198. 64	33, 288. IS	37, 158, 18	28, 198, 54	31, 853, 38	59. 521, 86	59, 739, 81	48, 397, 28	121, 181, 14	185, 832, 93	33, 33 <u>9, 1</u> 8	25, 886, 53	52, 518, 46	64, 635, 63	92, 993, 74	91, 949, 44	318, 743, 33	84, 885, 58	19, 369, 6  	
282 Croshed Aggregola Baso Courso		88, 783, 59	89, 308, 62	\$1, 254, 12	•	\$0, 546, 83	12, 212, 51	89. 256. iz	88, 893, 48	89, 258, 12	73, 548, 92	73, 121, 9 <b>8</b>	87, 498, 49	88, 258, 1Z	18, 731, 98	98, 409, 74	1, 225, 127, 75	98. 444. 25		-
388 (2) Craxbed Apprepats Surlaus Coure	78, 880, 40				81, 338, 88										-		107, 218, 40			-
381 (1) Bituminuus Prime Coal. MC-78 Cut-back Asphait		14, 119, 3 <del>1</del>	14, 119, 39	13, 775, 62		14, 443, 77	14, 578, 38	13, 775, 42	13, 775. 82	13, 175, 82	14, 234, 18	14, 234, 14	13, 775, 92	13, 735, 92	13, 775, 82	15, 437, 70 	197, 212, 35	15, 382, 18	 	-
383 (1) Bituminous Seal Ceat, Covur Aggregate, Type Z			3, 268, 95				3, 183, 87		2, 999, 21				2, 196, 21				12, 242, 64			-
383 (2) – Blitaniaous Prime Coalt, HC-688 Cul-back Asphell			14. 121. 27				11, 271, 28		10, 108. 27				18, 888. 27	·			43, 317, 18			-
384 (1) s Bitumineur Surtare Trestmant Gover Argregate Grading-A			28, 943, 85				21, 728, 73		28, 454, 84				20. 451. BZ				83, 574, 84			
382 (1) 5871væinova Surtaca Treatment Cover Aggregate Srading-8		11, 171, 12	8, 378, 71			10. 703. SS	<b>1, 685,</b> 78		8, 184, 44				8, 584, 46				54, 888, 99		<u> </u>	-
384 (1) Bituminaus Surtzen Trestmect UC-888 Cut-back Auphaft		18, 659, 80	40. 319. 33			· 19, 898, 83	41. 882. 98		39, 425. 83				39, {25, 83			-	198, 804, 48		<u> </u>	-
385 (1) – Bituninaus Punotration Nacadam Pavomuni, Aggragata				82, 148, 44				¥2, 848. 44		82, 840, 14		 		\$2, \$40, 14			333, 361, 76			_
385 (3) – Bituminous Penatration Macadam Parement, NC-888 Cut-back Asphalt				98, 289, 68				99, 289, 44		98, 289, 68				98, 289, 87			393, 158. 71		<u> </u>	
3]8 Blivminove Concrete Surtace Course, Rot-Loid											206. 912. 44	258, 132, 22			199, 947, 64	272. \$45. 22	938, <del>1</del> 37, 48	279. 093. 53		_
311(1) Pariland Coment Concrete Pavemunt, Pluin (1=18cm)																			465, 850, 80	•
584 Growtud Rtyruy Side Ottob			-						178, 205, 76	247, 588, 89	247. 509. 40	198, 803, 84					711, 825. 50			-
SP-1 Laboratory Apperatus	11, 258, 88	19, 250, 90	19, 258, 88	19, 250, 83	19, 259, 88	19, 259, 88	19, 250, 80	19, 250, 80	19, 259. 8 <b>8</b>	19, 258, 80	19, 258, 88	19, 250, <del>0</del> 0	19, 258, 00	19, 259, 80	19, 259. 40	13, 250, 10	388, 009, 98 	ļ	<u> </u>	
57-3 Laboratory Staff	6, 259, 84	8. 250. 80	8, 259, 00	f, 250, 80	8, 258, 88	6. 258. OD	8, 250, 80	6, 259, 88	8, 259, 98	\$, 258, 98	6, 258, 88	8, 258. 68	6, 258, 88	8, 258, 98	6, 254, 40	6, 258, 68	100, 000, 90	<u> </u>		
SP-6 - Yakielus far the Engineer's Staff	14, 882, 58	14, 062, 50	14, 462, 50	14, 862, 58	14, 882, 50	[4, 4\$Z, 58	14, 842, 50	14, 862, 58	14, 152, 58	14, 882, 58	\$4, 862, 59	14, 062, 50	14, 052, 50	14, 062, 50	14, 062, 50	14, 982, 50	225, 000. 00	ļ		
SP-7 Information Signs	2, 230. 81	2, 259, 99	2, 259, 89	2, 259, 98	2, 259, 89	2, 258, 88	2, 250, 80	2, 250, 11	2, 254, 64	2, 259, 44	2, 259, 69	2, 258, 84	£, 258, 88	2, 259, 49	2, 250, 00	2, 259, 04	36, 808, 88	<u> </u>	45, 000, 01	
SP-4 Photograph	2, 280. 20	2, 981, 10	Z, ODD. 88	2, 989, 88	2, 889, 89	2. 888. 88	2. 689. 68	2. 910, 88	2, 560, 80	2, 600. 00	2, 400, 90	2, 999, 99	2, 599, 99	2, 140. \$0	2, 088, 698		34, 209. 90			
Cust of Each Pavement Hode?	174, 445, 85	248, 355, 85	387, 837, <del>(</del> 4	387, 127, 58	180, 750, 83	265, 524, 85	335, 369, 30	485, 177, 57	564, 348, 79	714, (15, 1)	\$45, 471, 50	510, 179, 59	385, 348, 18	421. 168. 91	459, 278, 43		8, 352, 143, 21			
Paromont Unit Cast, Poso/of	147, 17	200. 48	249. 86	322. \$1	158. 11	211, (6	265. 18	338. 48	436, 23	588, 51	519, 39	451. 52	254, 12	351. 09	311. 17	129. 55		493, 54	(26)	

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#### Construction Cost

#### Section No. 1 to 4

Price Unit: Peso

Pay Item No.	Description	l Unit	Estimated Quantity	l Unit   Price	Total Price
102(2)	Surplus Common Excavation	P/m <sup>a</sup>	3,025.00	48.74	147,589.75
102(5)	i Surplus Excavation of Existing Pavement Section 3 and 4	F/m <sup>a</sup>	1,818.80	1 74.18	134,918.58
104(3)	Section Borrow for Topping, Case 2	P/m"	595.60	104.77	52,401.01
104(5)	 Embankment for Shoulder w/Naterials Obtained   from Excavation of Existing Pavement	P/m³	970.70	53.51	51,748.0
105	Subgrade Preparation	P/m²	21,522.05	5.22	112,345.10
108	Re-Shaping of Existing Shoulder	P/m²	337.00	5.28	1,779.3
200	Aggregate Sub-Base Course	P/m <sup>3</sup>	2,877.87	153.22	438,385.9
202	Crushed Aggregate Base Course	₽/m <sup>o</sup>	2,800.10	531.63	1,488,617.10
300(2)	Crushed Aggregate Surface Course	₽/m³	363.28	601.08	218,360.3
301(1)	Bit. Prime Coat, MC-70 Cut-Back Asphalt	P/MT	17.18	11,635.41	199,896.3
303(1)	Bituminous Seal Coat, Aggregate Type 2	P/MT	29.42	495.71	14,583.7
303(2)	Bit. Seal Coat, NC-800 Cut-Back Asphalt	р/нт	3.92	10,985.86	43,064.5
304(1)a	Bit. Surface Treatment, Aggregate Grading A	P/MT	133.36	· 599.23	79.913.3
304(1)b	Bit. Surface Treatment, Aggregate Grading B	р/мт	87.14	599.23	52,216.9
304(4)	Bit. Surface Treatment, NC-800 Cut-Back Asphalt	P/MT	17.80	11,157.75	198,607.9
305(1)	Aggregate for Bit. Penetration Macadam	P/MT	585.60	575.65	337,100.6
305(3)	l   MC-800 Cut-Back Asphalt for Bituminous   Penetration Macadam Pavement	Р/МТ	34.56	11,165.47	385,878.6
310	Bit. Concrete Surface Course, Hot Laid	P/MT	563.03	1,608.58	905,678.8
504	Grouted Riprap Side Ditch	P/LM	1,280.00	618.07	791,129.6
SP-2	Laboratory Improvement and Apparatus	Lump Sum	1.00	323,859.07	323,859.0
SP-3	Laboratory Staff	Lump Sum	1.00	106,668.49	106,668.4
SP-6	Yehicles for the Engineer's Staff	Lump Sum	1.00	225,000.00	225,000.0
SP-7	Informatory Signs	Each	8.00	4,513.97	36,111.7
SP-8	Photographs	Each	684.00	51.71	35,369.6
	Total				6,391,224.7

#### Construction Cost

Section No. 5

Price Unit: Peso

Pay Item No.	Description	l Unit	Estimated Quantity	Unit Price	Total Price
102(6)	Surplus Excavation of Pavement, Section No. 5	P/m <sup>3</sup>	522.50	151.68	79.252.80
104(5)	l Embankment for shoulder w/Materials Obtained I from Excavation of Existing Pavement	P/m <sup>3</sup>	458.30	229,45	105,156.94
105	Subgrade Preparation	P/m²	2,920.00	4.72	13,782.40
200	Aggregate Sub-Base Course	P∕m³	569,40	240.89	137,162.7
202	Crushed Aggregate Base Course	P/m <sup>o</sup>	225.00	405.66	91,275.5
301(1)	Bit. Prime Coat, MC-70 Cut-Back Asphalt	P/NT	1.34	18,560.00	24,870.4
310	Bit. Concrete Surface Course, Hot Laid	P/MT	167.50	1,510,40	252,992.0
311	Portland Cement Concrete Surface, Plain (t=18cm)	P/LM	1,340.00	388.19	520,174.6
SP-1	Demountable Field Office	2 Unit		18,758.40	37,516.8
SP-6	Vehicles for the Engineer's Staff	Lump Sum	1.00	86,470.65	86,470.6
SP-7	Informatory Signs	Each	2.00	3,548.80	7,097.6
	Total				1,355,750.4

-	i TENi			E NO,   idth ≈ 6,40 i 208 ∞ 808m	n		SECIION Caeriagaway Wi Langth ₩ 4×	dth == 6.40 r	m		SECTION Carringaway Wi Langth == 4×	idth 😐 🖲 🚺 r	m		. SECTIO Carriagaway Wi Laagth ≕ 4×	4th == \$.00 r	ຠ	SECTION No. 1 ~ ( .	CH Width Length =	DN NO 5 = 6. 70 m 2× 200 400m	SECTION No. 5
		GRAVEL	Sast	9851	127	GRAVEL	SBST	DEST	148	Dasi	849	AC (fon)	AC (5cm)	08\$1	BMP	AC ((cm)	AC (Sesi)	TOTAL	AC (Sem)	PCC (18cm)	JATOT
102 (2)	Surplus Connoa Ercavalión	15, 827, 48	18, 842, 19	20. 150. 11	20, 350, 31	15, 164, 37	18. 054. 74	19, (98, 92	19, 198, 92									147, 584, 75			
102 (5)	Socples Exceration of Existing Persons for Section KO, 3 and 4							· ·		28, 481, 52	28, 481, 52	13, 842, 14	13, 642, 44	10, 934, 14	FJ, 120, 96	15, 309. 78	15, 307, 78	134, 918, 58			
102 (6)	Swiplus Excavation of Existing Pasemant for Saction KO, S																		38, 626, 10	39. 626. 40	79, 252, 8
104 (3)	Selected Borrow for Topping. Gase 2	7. 866. 23	7, \$68, 23	7, 868, 23	7. 868. 23	1, 732, 93	7. 732. 03	7. 732. 83	7, 732, 00									\$2, 401, 91			
104 (5)	Embantment for Shoulder with Naterials ablained from Excavation of Existing Pavement									5, 886, 14	5, \$96. 44	5, 896, 14	5, 095, 44	7. 848. 57	7, 849, 57	7, 840, 57	7. 849, 55	51, 748, 82	52, 578, 47	52. 578. 47	185, 156, 1
101	Re-shaping of Existing Shoulder									318, 12	318. 12	318, 12	318, 12	126, 72	128, 72	128, 72	126, 72	1, 779, 36			
105 (11)	Subgrede Preparation (Commen Material)	6, 890, {P	7, 940. 85	7, 040, 89	\$, \$90, {0	7, 464, 17	7, 180, 89	7, 276, 18	\$, 889, 18	\$, 899. 48	6, 899, 49	7, 184, 39	7. 108. 39	6, 890, 49	\$, 839, 40	<b>i.</b> 890. 40	.7, 459, 49	117, 345, 10	6, 891, 20	<del>6</del> , 891, 20	13, 782, 41
290	Aggeogola Subbaso Course	10, 053, 78	16, 529, 33	18, 491, 34	10, 453, 78	16, 352, 63	25. 146. 64	29, 734, 82	20, 107, 56	11, 322, 61	\$2, 279, 56	16, 594, 83	12, 446, 85	26, 139, 83	92, 172, 10	48, 247, 39	45, 712, 49	438, 385, 14	86, 827, 89	79, 339, 88	137, 162, 7
202	Crushed Appropala Base Course		107, 573, 36	108, 516, 32	101, 152, 52		110, 020, 83	12, 142, #3	108, 457, 50	105, 581, 72	108, 452, 52	<b>\$9, {25, 18</b>	99. 86 <u>3.</u> 44	186, 219, 67	188, (52, 52	107, 014, 56	117, 144, 67	1, 488, 617, 18	11, 273. 30		J I. 273. 5
308 (2)	Crushed Aggregate Surface Coura	108, 194, 40				F10, 185, 84												218, 360, 34			
301 (I)	Bitaminous Prime Coat, NC-79 Cut-back Asphall		14, 311, 55	14, 311, 55	13, 862, 45		14, 689, 62	14. 776. 97	13, 962, (9	13, 562, 45	13, 987. 19	14, 427, 91	14, 427, 91	13, 962, 19	13. 982. 19	13. 982. 49	15. 242. 40	199, 896, 34	24, 470, 40		27. 178. 40
3 <b>0</b> 3 (1)	Bliuminoga Seat Coat. Coxer Aggregate, Type 2			3, \$53, 38				3. 792. 18		3, 569, 11				3, 569, 12				14. 583. 79			
393 (2)	Biluminous Prime Coal, NG-888 Cut-back Asphall			10, 788, 14				11, 205. 58		18, 546, 13				18, 545, 42				43, 064, 57			
304 ()) a	Biluminous Surface Treatment Cover Aggregate Grading-A			20, 028. 27				20, 769, 31		18, 558, 87				19, 558, 88				79, 913, 31			
36(()) 16(	Biluninous Sertace Trestment Cover Aggregate Grading-9		19, 013, 13	<b>8</b> , ≢11, 71			18, 234, 85	0, 305. 33		7, 425, 94				7, 825. 84				\$2, 216, 90			
364 (4)	Bilaminous Surtacu Treetment HC-490 Cut-back Asphail		18, 633, 84	48, 279, 48			<b>19. 079.</b> 75	41, 84 <u>1, 5</u> 6		39, 388, 86				39, 386, 86				198, 607, 95			
385 (I)	Bileminous Peastration Recedan Persuont, Aggregate				84, 275, 18				84, 235, 18		\$4, 215, 16				84, 275, 1 <b>5</b>			337, 100. 64			
385 (3)	Bitsminous Penetration Wacadam Parement, WC-800 Cut-back Asphalt				6, 469, 65				96. (69. 66		\$8, 469. 64				96. 469. 64			385, 378, 64			
310	Bilaninous Concreto Surtace Courso, Hot-Leié											199, 753, 46	249, 403. 79			193, 029, 80	263, 211, 95	905. 678. 80	252, 992, 89		252, 997. 80
311 (1)	Portland Cemant Concrute Pavement, Plain (t=jäcm)															_				520, 174, 50	520. IT4. 60
5\${	Growlod Riprog Sido Ditch									178, 004, 16	247, 228, 88	247. 228. 09	\$18, \$19, {I					791, 129. 60			
SP-1	Laboratary Apparatus	20, 241, 19	20, 211, 13	29, 241, 19	28. 26T, 19	28, 241, 1\$	28, 241, 19	29, 241, 13	28, 241, 19	20, 241, 19	28. 241. 19	29, 241, 13	20, 221, 19	20, 241, 19	20. 241. 19	20, 241, 19	20, 241, 22	323. 859. 07	1 R. 758. 40	18, 758. 40	37, 516, 80
\$P-3	Laboratory Stalf	6, 666, 78	8. 665. 78	\$, \$66. 7 <b>8</b>	8. 868. 78	6, 666. 78	6, 666, 78	f. 666. 78	\$, 366. 78	6, 668, 78	E. 686. 78	8, 868, 78	8. 665. 78	6. 565. 78	F, 555. 78	6, 586, 78	5, 666, 78	186, 668, 49			
\$P-\$	Yehicles for the Engineer's Staff	14, 862, 50	14, 062, 50	14, 662, 50	I4. 082. SD	14, 062. 50	14, 062, 50	14, 462, 58	14. 882. 58	14, 882, 58	14, 882. 38	[4. 852. 5 <b>9</b>	14, 862, 59	14, 862, 58	14, 862, 59	14. 062. 50	14, 052. 50	225, 998, 98	43, 235. 33	(3, 235, 33	86, 470, 81
SP-1	Information Signs	7, 257, 34	2. 257. 36	2, 257, 38	2, 257, 36	7, 257. 36	2. 257. 35	2, 257, 36	2, 257, 36	2. 257. 31	2. 257. 36	7, 257. 35	2, 257, 36	2. 251. 38	2, 257, 36	2, 257, 38	2. 257. 35	36, 117, 76	3, 548. 84	3, 548, 80	7, 097. 60
5.P-B	fhalograp)	2, 968, 48	Z, 068. 40	2, 968, 40	2, 068, 46	2, 868, 40	2, 868. 48	2. \$58. 40	2, 968. 49	2, 535, 50	2, 518, 92	2, 864, 44	2, 048, 40	2. 585. 50	2, 668, 92	2. 868. 10	2. 968. 10	35, 169. 64			
(°)	i al Esch Povement Model	F94, 136, 52	244. 413. 14	304, 611, 85	393, 618, 38	201, 717, 17	257. 406. 58	332, 373, 15	482, 684, 94	523, 358, 97	<b>667, 378, 72</b>	638, 891, 39	556, 753, 88	298. 811. 35	(09. 227. 33	517, 342, 52	\$17, 342, 52	6, 391, 224, 76	608, 597, 39	755, 155, 08	1, 355, 750. 47
	vamant Unit Cest, Peas/nł	161, 77	200. 53	247. 89	328, 92	165. 08	205. 08	260. \$3	335. 57	(36, 13	512.81	514, 58	448. 35	249. \$1	341. 02	395, 21	395, 21		448, 21	563, 55	_

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(Vait : ₽)

Appendix 8–8

## PROGRESS CHART OF EXPERIMENTAL PAVEMENT CONSTRUCTION

	BRESS OF EXPERIME	APRIL		MAY			JUNE		1	JULY	i jana iki ku na mana mana iki ku
	ITEMS			ſ <u></u>							
	MOBILIZATION	┉ᢤ┉╘╗╏ぺ┶┉	a in the standard and the standard standards and the standard standard standards at the standard standard stand Similar standards at the standard standard standard standard standard standard standard standard standard standa	rjar hur hur Underschandne dan La har 		ا في ما مراجع لي الحم في ما	lankashudun lankashudun ku	¦⊷		╎┈┞╼┞╾┠┈┠┉┠╼┣┉┽┻┽╺┵╼ ╎	i and a state of the stand
	EXCAVATION										
	SUBGRADE PREPARATRION			jaitings							<b></b>
	SUBBASE COURSE									C	HATE
Z O	BASE COURSE								MATERIAL STOCK	ILING OPERATION	
 	GRAVEL								·. ·.		
с Ш	SBST SBST			-							<u> </u>
S	SBST DBST										
	BMP			· · · · · · · · · · · · · · · · · · ·		<u>^</u>				<del>_</del>	
	SHOULDER					[		······			
	MOBILIZATION .		· · ·	ļ					3		
	EXCAVATION										
2	SUBGRADE PREPARATRION								.j		
z	SUBBASE COURSE										
ō	BASE COURSE	_			·		<u></u>				
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	EXCAVATION				6 DC0						
ഹ	SUBGRADE PREPARATRION SUBBASE COURSE				for PCC and AC se	· · · · · · · · · · · · · · · · · · ·					
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### Appendix 8–9

## WEATHER RECORDS OF EXPERIMENTAL PAVEMENT CONSTRUCTION

																				20						8									
ac Carita	st Office	Remarks													June 13-15 Typhoon Akang					June 18-23 Typhoon Bising						June 24-28 Typhoon Klaring									
: Trefe Wartir	DPWH, District Office	Weather	Rainy/Cloudy	Fair/Rainy	Fair/Rainy	Fair	Fair	Fair	Fair/Rainy	Rainy/Cloudy	Fair/Rainy	Fair/Rainy	Fair/Rainy	Fair/Rainy	Fair/Rainy	Cloudy/Rainy	Cloudy/Rainy	Cloudy/Rainy	Fine	Fair/Rainy	Cloudy/Rainy	Cloudy/Rainy	Rainy	Rainy	Cloudy/Rainy	Cloudy/Rainy	Cloudy/Rainy	Cloudy/Rainy	Cloudy/Rainy	Cloudy/Rainy	Fair	Fair			
Location		Rainfali (mm)	11.18	30.73	26,92	0	0	0	9.14	0.25	6.60	4.32	.51	.51	16.76	48.77	5.33 .	0	0	13.97	11.68	17.78	139.70	27.94	1.78	0.25	17.02	3.81	12.70	28.45	¢	0		436.1	
		Date	June 1	2	ę	4	'n	9	1-	Ø	61	01	11	12	13	14	15	16	17	18	6T	20	21	22	23	24	25	26	27	28	29	30		Total	
					-													-																	
1990	, Cavite City	Remarks																																	
d: Month of May 1990	: Sangley Point, Cavite City	Weather Remarks	Fair	Fair	Fair	Cloudy/Rainy	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair/Rainy	Fair	Fair	Fair	Fair/Rain	Fair	Cloudy/Rainy	Fair/Rain	Cloudy/Rainy	Cloudy/Rain	Fair/Rainy	Fair/Rainy	Fair/Rain	Fair	Fair/Rain	Fair/Rain	Fair/Rainy	Fair/Rainy	Fair/Rain		-
Rainfall Record: Month of May 1990	Sangley Point, Cavi			0 Fair					0 Fair												34.30 Cloudy/Rainy										22.60 Fair/Rainy			179.9	

Total

Rainfall Record: Month of June 1990

Rainfall Record: Month of May 1990

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σ

Date

May

8-9 (1)

	Location	: Trece Martirez, Down District	Cavite Defice
Date	Rainfall (mm)	Weather	Remarks
Aug. 1	2.29	Fair/Rain	
61	0	Fair	
n	0.25	Fair/Rain	
Ч	0	Fair	
ŋ	0	Fair	
6	0.51	Fair/Cloudy/Rainy	
7	0	Fair	
80	2.29	Fair/Rain	
6	c	Fair	
10	2.54	Fair/Rain	
11	0	Fair	
12	12.55	Cloudy/Rainy	
13	25.40	Fair/Rainy	
14	2.79	Fair/Rain	
15	17.27	Fair/Cloudy/Rainy	Aug. 15-20 Typhoon Gading
16	40.39	Fair/Cloudy/Rainy	
17	78.74	Rainy	
18	38.05	Fair/Rainy	
19	14.61	Fair/Cloudy/Rainy	
20	8.76	Fair/Cloudy/Rainy	
12	19.81	Rainy	
22	39.37	Rainy	
23	32.36	Rainy	
24	199.14	Rainy	Aug. 24-27 Typhoon Heling
36	20.32	Fair/Rainy	
26	33.02	Fair/Rainy	
27	13.45	Fair/Cloudy/Rainy	
28	13.21	Fair/Rain	Aug. 28 Typhoon Iliang
29	0	Fair	
30	17.53	Fair/Rain	
31	0.76	Fair/Rain	
Total	632.72		
		1	

Rainfall Record: Month of August 1990

Rainfall Record: Month of July 1990 Location : Trece Martirez, Cavite DPWH., District Office

July 6-15 Typhoon Deling July 28 Typhoon Emang Remarks Fair/Cloudy/Rainy Fair/Cloudy/Rainy Fair/Cloudy/Rain Fair/Cloudy/Rain Cloudy/Fair/Rain Cloudy/Rain/Fair Fair/Cloudy/Rain Fair/Cloudy/Rain Fair/Cloudy/Rain Fair/Cloudy/Rain Fair/Cloudy/Rain Cloudy/Rainy Cloudy/Rainy Cloudy/Rainy Cloudy/Rain Cloudy/Rain Weather Fair/Rain Fair/Rainy Fair/Rainy Fair/Rainy Fair/Rainy Fair/Rainy Fair/Rain Fair/Rain Rainy Fair Fair Fair Fair Fair Fair Rainfall (mm) 54.10 15.49 3.05 0.76 0.76 2.54 0.54 379.02 ŝ G Total Date July

#### 8 - 9 (2)

l EPC Project Cavite	REMARKS												Almost whole	night rainy.						-		Shower											
Section No. 1 E Magailanes, Cav	Weather	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair/Rain	Fair/Rain	Fair/rainy	Fair/Rain	Fair/Rain	Fair/Rain	Fair/Rain	Fair/Rain	Fair/Rain	Fair/Rain	Fair	Cloudy/Rainy	Cloudy/Rainy	Fair/Rain She	Fair	Fair	Fair	Fair	Fair	Fair	fair/Rain	Fair/Rain	Fair	Ғаіг	
Location :	Rainfall (mm)	0	0	0	0	0	0	0	3.30	٠	15.24		1.02		2.03	18.54	36.83	25.40	0	ტ.	27.94	5	0	0	0	0	0	0	2.54	•	0	0	204.75
I	Date	0ct. 01	03	03	4	05	90	20	08	60	10	11	12	13	14	13	16	17	18	19	20	21	22	23	24	25	26	27	ଅ ଅ	29	30	31	Total
												-																,					 

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Rainfall Record: Month of September 1990 Location

Rainfall record: Month of October 1990

: Trece Martirez, Cavite DPWH, District Office

Date	Rainfall (mm)	Weather	Remarks
Sept. 1	95,25	Rainy	
61	2.54	Fair/Rain	
3	10.67	Fair/Rain	
শ	8.89	Fair/Rain	
ى ە	6.10	Fair/Rain	
9	13.72	Fair/Rainy	Sept. 6 - 7 Typhoon Loleng
7	72.39	Fair/Rainy	
8	13.72	Fair/Rainy	
ŋ	0	Fair	
10	0	Fair	
11	0	Fair	
12	0	Fair	
13	25.40	Fair/Rainy	
14	10.12	Feir/Rain	
15	11.94	Fair/Rain	
16	0	Fair	
17	0	Fair	
18	0	Fair	
19	19.05	Fair/Rain	
20	0	Fair	
21	1.52	Fair/Rain	
22	2.03	Fair/Rain	
23	5.08	Fair/Rain	
24	1.27	Fair/Rain	
25	0	Fair	
28	5.60	Fair/Rain	
27	2.29	Fair/Rain	
28	1.27	Fair/Rain	-
29	3.30	Fair/Rain	
30	1.80	Fair/Rain	
Total	313.95		

8 - 9 (3)

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Rain

l EPC Project Cavite	REMARKS	Const. finished Sec. No. 1 Sec. 1		
Section No. 1 Magallanes, Ca	Weather	Fair Fair/Rain Fair Fair		
Location :	Rainfall (mm)	00°°°°00 800 800	41.35	
1	Date	No 0 0 0 0 0 0 0 0 0 0 0 0 0	Total	

## Appendix 8–10

## MATERIAL TEST RESULTS OF EXPERIMENTAL PAVEMENT CONSTRUCTION

TABLE 1 AGGRE USED	AGGREGATE FOR SUBBASE COURSE USED IN SECTION NO. 1 AND NO	UBBASE COU NO. 1 AND	COURSE AND NO. 2	,
Materials : River-run Sandy Gravel Source : Mobato Quarry, Cavite	andy Grave ry, Cavite	н		Materials Source
Test Items	Test	Test Results	Specification Item 200	
Sieve Analysis (& Passing) Sieve Stare	1 1 1 1 1 1 1 1 1		171111111111	Sieve Analy Sieve Analy
	æ	100	100	01606010 50 01
	dP	69	55 1 85	25.0
9.5 nm	æ	70	ı	6.5
0.075 mm	æ	63	0 - 12	0-075
Liguid Limit		AP NP	<35	Liquid Limi
Plasticity Index		AN	2 <del>1</del> 2	Plasticitv
Abrasion Loss	æ	43	< 50	Abrasion Lo
Moisture Density Relation				Moisture De
(AASHTO T-180 C)	1			(AASHTO T-1
Maximum Dry Density	Kg/m <sup>5</sup>	1,940		Maximum
Optimum Moisture				Optimum
Content	æ	16.6		,
California Bearing Ratio (At MDD)	d٩	50	>25	Californía (*+ MDD)
Swell	æ	0		Swell

TABLE 2

AGGREGATE FOR SUBBASE COURSE USED IN SECTION NO. 3 AND NO. 4

: River-run Sandy Gravel : Mamba Quarry, Cavite Mamba River

	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Test Results	Specification Item 200
Sieve Shalysis (& Passing) Sieve Size		4 4 5 7 7 7 7 7 7 7 7 7 1 1	
50.0° mm	8	100	100
25.0 mm	æ	69	55 - 85
9°2 mm	đP	58	40 - 75
0-075 mm	æ	5	0 - 12
Liquid Limit		29	< 35
Plasticity Index		ŝ	¢12
Abrasion Loss	æ	41	<50
Moisture Density Relation (AASHTO T-180 C)			
Maximum Dry Density	Kg/m <sup>3</sup>	1,963	
Optimum Moisture			
Content	æ	10.2	
Californía Bearing Ratío (At MDD)	æ	53	>25
Swell	đQ	0.87	
			******

Sample meets Specification Reguirements.

8-10 (1)

		TOR NOTION NT TOPS		10 F F F F F F F F F F F F F F F F F F F	SECTION NO. 2, NO.	3 AND NO.	. 4
Materials : Crushed Source : Unirock	Stone Quarry, A	: Crushed Stone : Unirock Quarry, Antipolo, Rizal		Materials : Crushed Stone Source : Unirock Quarr	Crushed Stone Unirock Quarry, Antipolo, Rizal	lo, Rizal	
Test Items		Test Results	Specification Item 202	Test Items	Test Results	esults	Specification Item 202
Sieve Analysis (& Passing	g)		*************	Sieve Analysis (% Passing)			
Sieve Size				Sieve Size			
37 <b>.</b> 5 mm	æ	100	1 00	37 <b>.</b> 5 mm	æ	100	100
25.0 mm	æ	1	ı	25 <b>.</b> 0 mm	æ	81	ı
19 <b>-</b> 0 mm	æ	19	60 - 85	19 <b>.</b> 0 mm	đQ	71	60 - 85
9.5 mm	æ	1	E .	9.5 mm	æ	ŝ	ı
4.75 rum	95	55	30 - 55	4.75 mun	æ	38	30 - 55
0.425 mm	æ	13	8 - 25	0.425 mm	42	15	8 - 25
0.075 mm	đ	'n	2 - 14	0.075 mm	đÞ	10	2 - 14
Liquid Limit		đN	<25	Liquid Límit		23	¢25
Plasticity Index		ΑN	9 V	Plasticity Index		4	9 V
Abrasion Loss	8	1	< 45	Abrasion Loss	\$3	35	< 45
Moisture Density Relation	G			Moisture Density Relation			
(AASHTO T-180 C)		ſ		(AASHTO T-180 C)			
Maximum Dry Density	rm/sx	1,940 <sup>1</sup>		Maximum Dry Density	Kg/m <sup>3</sup>	2,277	
Optimum Moisture				Optimum Moisture			
Content	dP	12.0		Content	0 <b>1</b> 2	5.8	-
California Bearing Ratio	90		>80	California Bearing Ratio	47	117	>80
(At MDD)				(At MDD)			
Swell	đP	1		Swell	đe	60"0	

8 - 10 (2)

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SURFACE COURSE	
AGGREGATE FOR AGGREGATE	USED IN SECTION NO. 1
TABLE 5	

Materials : Blended Crushed Stone Source : Urto Interprizes, Batangus

Test Items	Test	Test Results	Specification Item 300
Sieve Analysis (& Passing) Sieve Size	1 		Grading A
50.0 mm	dР	100	100
9.5 mm	æ	68	55 - 85
4.75 mm	æ	52	25 z 65
2.00 mm	dP	38	25 - 50
0.425 mm	¢10	18	15 - 30
0.075 mm	<b>46</b>	10	5 - 20
Liguid Limit		1	<35
Plasticity Index		7	6 - ¥
Abrasion Loss	æ	ı	< 45
Moisture Density Relation (AASHTO T-180°C)			
Maximum Dry Density	kg/cm <sup>3</sup> 1	1,920	
Optimum Moisture Content	de I	14.3	

TABLE 6 AGGREGATE FOR AGGREGATE SURFACE COURSE USED IN SECTION NO. 1

Materials : Blended Crushed Stone Source : Unirock quarry, Antipolo, Rizal

Test Items	Test	Test Results	Upecanitication Item 300
Sieve Analysis (& Passing) Sieve Analysis (& Passing) Sieve Stare	4 1 1 1 1 1 1 1	r	Grading A
	ጭ	100	100
	æ	57	55 - 85
4.75 mm	æ	45	25 - 65
2.00 mm	đP	31	25 - 50
0.425 mm	¢P	16	15 - 30
0.075 mm	¢¢	σ	5 - 20
Liquid Limit.		29	< 35
Plasticity Index		œ	4 - 9
Abrasion Loss	æ	35	< 45
Moisture Density Relation			
Maximum Dry Density	kg/cm <sup>3</sup>	2,360	
Optimum Moisture Content	<b>6</b> 89	7.4	

TABLE 7 AGGREGATE FOR BMP

Materials : Crushed Stone 1-1/2" Source : Angono, Rizal

Test Items	Test I	Test Results	Specification Item 305
sieve Analysis (& Passing)	] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ]		
Sieve Size 63 d mm	ch	100	100
	o de	100	100
37.5 mm	đ	73	35 - 75
	æ	12	0 1 15
19.0 mm	dip	ഹ	I
	65	m	л 1 0
9.5 mm	đP	ı	ł
4.75 mm	æ	ŀ	I
Bulk Specific Gravity (SSD)	цę	2.80	
Absorption	æ	0.80	
Abrasion Loss	æ	е <b>г</b>	< 40

8-10 (4)

TABLE 8 AGGREGATE FOR BST AND BMP

Materials : Crushed Stone 3/4" Source : Angono, Rizel

Test Ttens	Hoot toot	Test Results	Specification EST EMP	atíon BMP
			Item 304	305
40 			Grading A	υ
Sieve Size			•	
25.0 man	dр	100	¥	100
19 <b>.</b> 0 mm	æ	97	- 06	- 100
12.5 mm	æ	54	20	ری می
9.5 mm	æ	12	0	15
4.75 nun	æ	4	0	ი ი
2.36 mm	\$	1		
Bulk Specific Gravity (SSD)		2.8(	0	
Absorption	đ٩	0.8		
Abrasion Loss	đP	20	•	< 40

Remarks: Sample meets Specification Requirements.

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Remarks: Sample meets Specification Requirements.

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TABLE 9 AGGREGATE FOR BST AND DEST

: Crushed Stone 3/8" : Angono, Rizal Materials Source

Test Items	Test	Test Results	Specification BST BMP	ation BMP
			Item 304	305
Sieve Analysis (% Passing)			Grading B	Δ
Sieve Size				
12.5 mm	æ	100	1(	100
9°5 mm	æ	66	85 -	- 100
4.75 mm	dР	19	10	08 -
2.36 mm	đP	m	0	0
1.18 mm	æ	ы	. 0	n I
0.30 mm	æ	ı		•
Bulk Specific Gravity (SSD)		2.75	10	
Absorption	æ	1.40	0	
Abrasion Loss	æ	22	\$	< 40

TABLE 10 AGGREGATE FOR BITUMINOUS SEAL COAT

: Crushed Sand : Angono, Rizal Materials Source

	Test	Test Results	Specification Item 303
Sieve Analysis (% Passing) ciono cino			Type 2
	96	100	100
4.75 mm	ар Ф	97	85 - 100
2.36 mm	96	10	60 - 100
1.18 mm	æ	43	ı
0.300 mm	đP	8	I
0.150 mm	46	m	0 - 10
Bulk Specific Gravity (SSD) Absorption	de	2.75 1.48	

Remarks: Sample meets Specification Requirements.

8-10 (5)

TABLE 11 EMULSIFIED ASPHALT

: Cationic Emulsified Asphalt CSS-1h : Rigid Sales Corporation : Prime Coat, Seal Coat, BST and BMP Source Proposed Use Materials

Test Items	Test	Test Results	Specification AASHTO M-208
Viscosity	, 1 1 1 1		
(Saybolt furol) 25°C	v	27	20 - 100
Stability	æ	0.1	1.0 max
Cement mixing	æ	2.0	2.0 max
Sieve test	æ	0.1	0.1 max
Residue by distillation	æ		57 min
Residue			
Penetration, 25 <sup>o</sup> C, 100g, 5 sec		60	40 - 90
Ductility 25°C	E U	100	40 min
Solubility in tricloethlene	ф	98.7	97.5 min
Specific Gravity 25°C/25°C		1.01	
Demostre. Completing Statification Demostre			

Remarks: Sample meets Specification Requirements.

TABLE 12 ASPHALT CEMENT

: Straight Asphalt 60 - 70 : Petrophil Corporation : Asphalt Concrete Mixture Materials Source Proposed Use

Test Items	Test	Test Results	Specification AASHTO M226
Penetration at 25°C, 100 g 5 sec Flush Point COP	υ		60 - 70 232 min
Ductility 25°C Loss of heating Solubility in trichloethylene	C) ee ee Ei	118 0.3 99.5	100 min 0.5 max 99.0 min
Residue Fenetration % of original Ductility 25 cm/min Spot Test Specific Gravity 25 <sup>o</sup> C/25 <sup>o</sup> C	8° 8 5	61 100 Negative 1.01	54 min 50 min Negative
Remarks: Sample meets Specification Reguirements	cation	Reguirements	



# Aggregate Blending Proportion

Materials		Production by Wt. Percent	Specific Gravity
3/4" Crushed Stone	Golden Hills Taytav, Rizal	10%	2.80
3/8" Crushed Stone Crushed Sand	17 F	ຊາ <del>ຍ</del> ເຄີຍ ເຄີຍ	2.83 2.58
Natural Sand	Bulcan	158	2.31
		P 0 0	

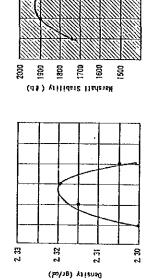
Blended Aggregate Gradation (Passing Sieve by Wt. Percent)

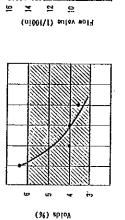
Sieve Size	Gre	Grading 8	Specification Item 310, Type F
н 19	ты. П. 100	100	100
		94	,
9,5 1		91	I
4.75 H	mm 6	63	45 - 65
		48	33 - 53
1.18 п		33	ı
0.300 a	Line Charles	1	10 - 20
0.075 n	шш	ŝ	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

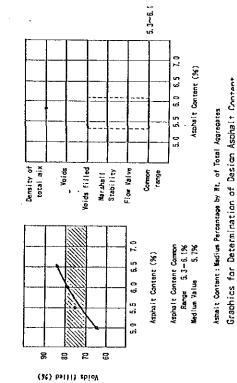
Marshall Test Properties of Mixture at Optimum Asphalt Content of 5.7% by Wt. of Total Mix

Test It	• .	Test Results	Specification Min Max	ation Max
Density	gr/cm <sup>3</sup>	2.32		1
Stability	qT	1,920	1,200	1
Flow	0.01 in	11.8	<b>60</b>	16
Void	95	4.2	m	v
Void Filled	æ	73	70	80
Remarks: Test	Results meet	Test Results meet Specification Requirements.	ion Reguirements.	









8 - 10 (7)

Table No. 14 to Table No. 27 Test Results of Materials used in Section No. 5

TABLE 14 AGGREGATE FOR SUBBASE COURSE

Materials Source	: Blendeâ Aggr : Angono, Quar	regates of Crus ry and Trece M	Crushed S ece Martre	nd/Soil Y
Test Items		Test	Test Results	Specification Item 200
Sieve Analysis Sieve Size	- <del>8</del>		             	
50.0 mm		æ	100	100
25.0 mm		æ	85	55 - 85
9.5 mm		æ	46	40 - 75
0.075 mm		62	ത	0 - 12
Liguid Limit			32	<35
Plasticity Index	Xa		12	212
Abrasion Loss		æ	42	50
Moisture Density (AASHTO T-180 C)	ty Relation			
Maximum Dry Density	Density	Kg/m <sup>3</sup>	1,980	
Optimum Mois	Moisture			
Cont	Content	æ	8 <b>.</b> 9	
California Bean (At MDD)	Bearing Ratio	æ	27	> 25
. 바 드 두 두 두 두 두 두 두 두 두 두 두 두 두 두 두 두 두 두	******	1 1 1 1 1 1 1 1		4 7 8 3 8 9 8 8 8 9 8 9 7 8 8 9 7 8 8 9 8 9 8 9

Remarks: Sample meets Specification Requirements.

TABLE 15 AGGREGATE FOR SUBBASE COURSE

source	Unirock	Quarry.	Antipoto,	DIO, KIZAL	
Test Items			Test	Results	Specification Item 200
ieve Analysis Sieve Size	(& Passing	д)			Grading A
ິທ			÷	100	100
25.0 mm			ď	86	ł
19.0 mm			\$2	18	60 - 35
9.5 MM			đŶ	6 S	ŀ
4.75 mm			¢Þ	47	30 - 55
0.425 mm	·		æ	18	8 - 25
0.075 mm			dР	<u>۲</u>	2 - 14
Liguid Limit				25	<25
Plasticity Index				Ø	< 6
Abrasion Loss			¢	28	< 45
Moisture Density	r Relation	G			
Maximum Dry I	Dry Density	Χq	Kg/m <sup>3</sup>	2,110	
Optimum Moisture	- əzni			•	
Content	ent .		\$	8.4	
California Bearing	ng Ratio		, dP	46	>80
(At muu) Swell			· do	•	

TABLE 16 EMULSIFIED ASPHALT

Materials : Emulsified Asphalt SS-1 Source : Petrophil Corporation Proposed Use : Prime Coat

,

Specification AASHTO M-140

			AASHTU M-140	- 2	0
ty		 			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
(Saybolt furol) 25°C	03	25	20 - 100	100	
Stability	\$	0.6		1.0	тах
Cement mixing	<del>4</del> 6	1.7		2.0	max
Sieve test	\$	0.05		0.1	Max
Residue by distillation	8	60.5	,	57	nin
Residue					
Penetration, 25°C, 100g, 5 sec		110	100 - 200	200	
Ductility 25 <sup>o</sup> C	Ē	115	•	40	min
Solubility in tricloethlene	æ	99.2		97.5	97.5 min
Specific Gravity 25°C/25°C		1.02			

Remarks: Sample meets Specification Reguirements.

TABLE 17 ASPHALT CEMENT

Materials : Straight Asphalt 60 - 70 Source : Petrophil Corporation Proposed Use : Asphalt Concrete Mixture

Test Items	Hest Hest	Test Results	Specification AASHTO M226
Penetration at 25°C, 100 g 5 sec Flush Point COP	ပ္ပ	338 338	60 - 70 232 min
Ductility 25°C Loss of heating Solubility in trichloethylene	جه en E	>120 0.02 99.9	100 min 0.5 max 99.0 min
Residue Penetration % of original Ductility 25 cm/min Spot Test Specific Gravity 25 <sup>o</sup> C/25 <sup>o</sup> C	* U	66 >100 Negative	54 min 50 min Negative
Remarks: Sample meets Specification Reguirements.	cation	Requirements	***

COARSE AGGREGATE FOR ASPHALT CONCRETE		Test Results			<b>8</b> 100	<b>3</b> 64	<b>%</b> 35	<del>8</del> 2	ъ	2.81	s 1.13	<del>ፄ</del> 25	ſ	kg/m <sup>2</sup> 1.32	kg/m <sup>3</sup> 1.44	
TABLE 18 COARSE AGGREGATE F	Materials : 3/4" Crushed Aggregate Source : Monterock, San Mateo, Rizal	1	Sieve Analysis (% Passing)	Sieve Size	19.0 mm	12.5 mm	9.5 mm	4.75 mm	0.075 mm	Bulk Specific Gravity (SSD)	Absorption	Abrasion Loss	Dry Unit Weight	Loose		8281389888888888888888888888888888888888

TABLE 19 COARSE AGGREGATE FOR ASPHALT CONCRETE

.

Test Items Tesults	Test	Test Results
Sieve Analysis (& Passing)	 	
Sieve Size		
12.5 mm	æ	100
9.5 mm	ъ	93
4.75 thm	æ	18
2.36 mm	æ	ო
0.075 mm	đ	0
Bulk Specific Gravity (SSD)		2.81
Absorption	æ	1.13
Abrasion Loss	æ	25.8
Dry Unit Weight		
Loose	Кд/ <u>п</u> 3	1.32
Rođed	ka/m <sup>3</sup>	1 46

•

TABLE 20 FINE AGGREGATE FOR ASPHALT CONCRETE

: Manufactured Sand : Monterock, San Mateo, Rizal Materials Source

	Test R	Test Results
Sieve Analysis (& Passing)		
Sieve Size		
9.5 mm	dе	100
4.75 mm	æ	66
1.18 mm	æ	55
0.300 mm	æ	13
0.075 mm	đP	2
Bulk Specific Gravity (SSD)		2.86
Absorption	е е	3.63
Dry Unit Weight		
Loose	kg/m <sup>2</sup>	1.53
Roded	kg/m <sup>3</sup>	1.63

TABLE 21 MINERAL FILLER FOR ASPHALT CONCRETE

.

: Hydrated Lime : Guanzon Lime, Lucena City, Quezon Materials Source

Test Items	Test Results	s Specification Item 703 A
Sieve Analysis (% Passing)		
Sieve Size 0.600 mm	8 100	1 00
0.300 пла	8 98	95 - 85
0.075 mm	<b>8</b> 85	70 - 100
Calcium Oxide & Magnesium Oxide (Non-Volatile Basis)	99 98	60 min
Remarks: Sample meets Grading Requirements of Specification.	Requirements	of Specification.

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## Aggregate Blending Proportion

Materials	Material Source	Proportion by Wt. Percent
3/4" Crushed Stone Monterock.	San Mačeo, Rizal	
1/2" Crushed Stone	E	20 %
3/8" Crushed Stone	Ξ	21 &
Manufactured Sand	. =	44 8
Hvdrated Lime	Guanzon Lime, Lucena, Quezon	аР +-
Total		100 \$
	***********************************	* * * * * * * * * * * * * * * * *

Blended Aggregate Gradation (Passing Sieve by Wt. Percent)

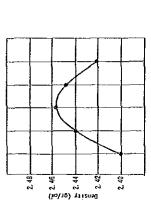
Sieve Size	Grading %	pecificat em 310, T
19 RH	100	
ч Ч	96	1
	84	I
ហ	55	45 - 65
2.36 mm	4.0	33 - 53
	35	ł
0.300 mm	15	10 - 20
	ហ	3 - 8

Marshall Test Properties of Mixture at Optimum Asphalt Content of 5.8% by Wt. of Total Aggregates

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		Specification	Specification	cation
Test Items		Test Results	Min	Max
Density		2.45		
Stability	qT	2,756	1,200	ı
	0.01 in		.80	<del>1</del> 6
5101	đ	ຕ. ທ	m	9
Void Filled	, ф	12	20	80
Remarks: Test Resul	Results meet S	pecification R	equirements.	



karshati Stebility (tb)

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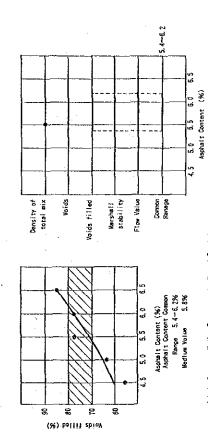
2900

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Ashalt Content: Medium Pertenninge by Wi. of Total Agarepates Graphics for Determination of Design Content

8 - 10 (12)

## TABLE 23 JOB-MIX FORMULA

Mix Proportion

Materials	By Wt	ч о •	Aggregate		otal Miy
3/4" Crushed Stone		14	1 1 1 1 1 1 1	13.23	1 1 1 1 1 1 1 1
1/2" Crushed Stone		50	æ	18.90	æ
3/8" Crushed Stone		21	æ	19.85	æ
Manufactured Sand		44	æ	41.59	db
Hydrated Lime		-	æ	0.95	\$9
Asphalt Cement 60/70		ິ. ທີ	5.80 %	5.48	*
			Total	100	90

## Job-mix Formula

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Sieve Size		Design Grading Tolerance & Passing &	Tolerance &	Job-mix Tolerance *	Spec.
19	E	100	0	100	100
12.5	шш	96	3	I	ı
و. د	шш	84	I	1	t
4.75		55	ዊ +	48 - 62	45 - 65
2.36	ШШ	43	4	39 - 47	33 - 53
1.18		35	, <sup>1</sup>	I	ı
0.300		15	+  4	11 - 19	10 - 20
0.075	шш	ŝ	0   +	3 - 7	യ പ ന

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2. Asphalt Content:

**********	Tolerance	5.9
	ín-dor	
*********************	nce	+ + +
	Design Asphalt Content %	ស ភ្ល ភ្ល
		Aggregate Total Mix
	halt tent	wt. of wt. of
	Asp	7 7 7 8 8

 Mixing Temperature: Temperature at Tolerance Job-mix Mix Design Test Tolerance 139<sup>o</sup>C <u>+</u>10<sup>o</sup>C 129 - 149<sup>o</sup>C

PORTLAND CEMENT TABLE 24 : Portland Cement (Type-1)
: Island Cement Corporation, Antipolo, Rizal
: Portland Cement Concrete Materials Source Proposed Use

Test Items	Test Test	Test Results	Specif	Specification AASHTO: M85
Finesse: Residue on No. 200, sieve Blain specific surface			, , , , , , ,	t 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Specific Gravity 3.15 Normal consistency	æ	25.8		
Soundness: Autoclave expansion Boil Test	cip	- Sætisfactory		0.8 max
Time of setting: Initial set, minutes Final set, hours		132	60 10	min Max
Compressive strength 1 day 3 davs	psi isq	- 220	1,800	nin
	isd isd	2,880 4,020	2,800	
Chemical analysis Loss on ignition Insoluble residue Sulfur trioxide (SO <sub>3</sub> ) Magnesium oxide (MgO)	ሪም ላቅ ላጭ <b>ህ</b> ቅ		0 0 0 0 • 0 0 0 • 0 0 0 • 0 0 • 0 0 • 0	<b>ТАХ</b> ТАХ ТАХ

...... 9.2 9 æ Sulfur trioxide (SO3) Magnesium oxide (MgO) 

\*\*\*

Remarks: Sample meets Specification Reguirements.

FINE AGGREGATE FOR PCC : Sand : Porac, Pampanga TABLE 25 . Materials Source

.

	Test	Test Results	Specification Item 311
Sieve Analysis (% Passing) Sieve Size	e 1 1 1 1	ŧ	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
9.5 mm	æ	100	100
4.75 mm	ф,	97	95 - 100
2.36 mm	æ	80	ı
1.15 mm	đP	58	45 - 80
0.600 mm	dР	35	1
0.300 mm	а <sup>р</sup>	13	00 1 1
0.150 mm	цр	ব	0 1 10
0.075 mm	æ	~	ŧ
Fines Modules		3.13	
Bulk Specific Gravity (SSD)		2.58	
Absorption	49	1.30	
Dry Unit Weight			
LIOSO LIOSO	kg/m <sup>3</sup>	1,513	
Lose Roded	kg/m <sup>3</sup> kg/m <sup>3</sup>	1,513	

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Remarks: Sample meets Specification Requirements.

Test Items	Test	Test Results	Specification Item 311
<pre>sieve Analysis (% Passing)</pre>	       		Grading C
Sieve Size	,		
50.0 mm	æ	100	001 - G6
37.5 mm	æ	100	ŀ
-	æ	70	35 - 70
0	dР	51	ł
- LO	æ	27	10 - 30
ري ا	ф,	18	ı
4.75 mm	æ	4	in I
'n	æ	۳ <b>،</b> 0	3
Bulk Specific Gravity (SSD)		2.77	
Absorption	đ		
Abrasion Loss	æ	26	
Drv Unit Weight		0.4	
Lose	kg/m <sup>3</sup>	1,585	
Roded	kg/m <sup>3</sup>	1,786	

TABLE 27 PCC MIXTURES PROPERTIES

COARSE AGGREGATE FOR PCC

TABLE 26

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	40.0 %9 125.7 kg 74.0 kg 18.6 kg
	Cement
į	о Н
	Bag
i	н өд
	Proportion Aggregate ggregate
	Mixing Cement Coarse Fine Ag Water
i	А.

B. Properties of Mixture

9.5 bags/m <sup>3</sup> 0.64 2.5 - 3 în.	(įsį)
ð days	Strength 600 624 558 558 558 533 533 532
Cement Factor Water Cement Ratio Slump Flexural Strength at 28	Н 8 8 20 20 20 20
- 11 10 4	

Remarks: Sample were taken from manufactured PCC mix. Flexural strength of each test No. were the mean value of 3 specimens, and tested by the third-point loading method. 

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Average

### 8 - 10 (15)

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### Appendix 8–11

## QUALITY CONTROL TEST RESULTS OF EXPERIMENTAL PAVEMENT CONSTRUCTION

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COURSE,
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MODEL
TABLE

Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	ems.		0 + 0	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	× E	100	100	100	100	100
% Passing	25	ы Ш	06	85	87	87	55 - 85
a Sieve	9.5	nn X	52	71	78	76	40 - 75
	0.425 mm %		ı	r	ı	1	ı
	0.075 mm X	ж Ш	11	œ	10	10	0 - 12
Moisture Content	ontent	ж	12.1	11.0	11.8	11.7	
Field Density		gr/cm <sup>3</sup>	1.85	1.88	1.90	1.88	
Compaction Degree	· Degree	ж	96	67	86	25	>95

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Right Lane 1.5 m from Center Line

,							
Chainage Test Items	e B S		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	к Ш	100	100	100	100	100
% Passing	25	ww %	82	85	89	85	55 - 85
a Sieve	9.5		74	74	75	74	40 - 75
	0.425	20 X	ı	•	1	•	,
	0.075	0.075 mm X	12	11	12	12	0 - 12
Moisture Content	ontent	х	12.6	13.2	9.5	11.8	
Field Density	i ty	gr/cm <sup>3</sup>	1.90	1.92	1.96	1.93	
Compaction Degree	Degree	*	98	66	101	<b>3</b> 8	>95

TABLE 2 MODEL NO. 2 SBST: SUBBASE COURSE, h = 8 cm

Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	ស ស ស ស ស ស ស ស ស ស ស ស ស ស ស ស ស ស ស		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	E E E	100	100	100	100	100
% Passing	25	X Egg	85	82	92	86	55 - 85
a Sieve	9.5		74	74	81	76	40 - 75
	0.425 mm %	X K	ı	ł	1	·	ł
	0.075 mm ×	と自己	7	11	П	10	0 - 12
Moisture Content	ontent	ж	15.3	13.6	12.9	13.9	
Field Density		gr/cm <sup>3</sup>	1.98	1.92	1.90	1.93	
Compaction Degree	Degree	х	102	66	<u> </u>	100	>95

Right Lane	Lane			1.5 m fr	1.5 m from Center Line	Line	-	
Chainage Test items	ems Sms			0 + 20	0 1 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	ME N	×	100	100	100	100	100
% Passing	25	60	×	38	94	83	52	55 - 85
a Sieve	9.5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	×	06	83	11	81	40 - 75
	0.425	2 UU	×	ı	,	ı	1	ı
	0.075	mm X	×	14	7	80	10	0 - 12
Moisture Content	ontent		×	11.4	11.7	14.3	12.5	
Field Density		gr/cm <sup>3</sup>	e E	I.94	1.98	1.90	1-94	
Compaction Degree	Degree		×	100	102	85	100	>95

8-11 (1)

TABLE 3 MODEL NO. 3 DBST: SUBBASE COURSE, h = 9 cm

Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	50	X UU	00 I	100	100	100	100
% Passing	25	700 X	74	84	85	78	55 - 35
a Sieve	9°0	X EE	74	11	72	72	40 - 75
	0.425 mm ×	X UQ	,	•	,	ı	•
	0.075 mm 2	500 X	10	80	7	10	0 - 12
Moisture Content	ontent	ж	15.5	14.3	15.0	14.9	
Field Density		gr/cm <sup>3</sup>	1.98	I.95	2.03	1.99	
Compaction Degree	Degree	ж	102	101	105	201	>95

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Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test (tems	e e e		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	자 퉅	100	100	100	100	100
% Passing	25	X Eu	85	<del>95</del>	16	06	55 - 85
a Sieve	9.5	н 2 2	73	76	84	78	40 - 75
	0.425	2 UU	,	۱	1	,	,
	0.075 mm %	2 au	6	11	13	11	0 - 12
Moisture Content	ontent	ж	14.2	14.5	15.1	14.4	
Field Density		gr/cm <sup>3</sup>	1.86	1.90	2.07	1.94	
Compaction Degree	Degree	×	96	86	107	100	56<

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TABLE 4 MODEL NO. 4 BMP: SUBBASE COURSE, h = 5 cm

Left Lane	ane		1.5 = 11	1.5 m from Center Line	2017		
Chainage Test Items	SEO		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	50	× fe	100	100	100	100	100
% Passing	25	X EQ	88	82	83	84	55 - 85
a Sieve	9.3	800 X	77	73	71	74	40 - 75
	0.425	an X	•	١.	ı	1	ı
	0.075	2011 X	6	11	12	11	0 - 12
Moisture Content	ontent	ж	16.5	10.2	13.8	13.5	
Field Density		gr/cm <sup>3</sup>	1.90	1.88	2.02	1.93	
Compaction Degree	Degree	×	98	57	104	100	>95

Right Lane		1-5 m fr	1.5 m from Center Line	Line		
Chainage Test Items		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading: 50	ĸ	100	100	100	100	100
z Passing 25	z ma	85	. 84	89	86	55 - 85
a Sieve 9.5	2 UU	74	72	78	75	40 - 75
0.425	X 600	ı	•	•	,	,
0.075	0.075 mm %	11	8	12	10	0 - 12
Moisture Content	*	14.0	10.0	14.0	12.7	
Field Density	gr/cm <sup>3</sup>	1.86	1.92	1.92	1.90	
Compaction Degree	ж	96	66	66	98	56<

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Chainage Test Items Grading: 50 mm %	0 + 50				
50 mm X		0 + 100	0 + 150	Average	Spec.
ng 25 mm	100 91	100 84	001 90	100 88	100
a Sieve 9.5 mm x 0.425 mm x	79 19	72 18	74 33	75 23	40 - 75 -
0.075 mm X	80	9	10	80	0 - 12
Moisture Content X	13.7	11.0	10.3	11.7	
Field Density gr/cm <sup>a</sup>	1.96	1.94	1.94	1.95	
Compaction Degree 2	101	100	100	100	>95

Chainage Test Items	ង		0 + 20	001 + 0	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	ла Ма	100	100	100	100	100
% Passing	25	N 2	38	100	35	85	55 - 85
a Sieve	9.5	X UUU	88	06	82	87	40 - 75
	0.425		23	18	14	18	,
	0.075 mm %	mm X	10	7	G	ø	0 - 12
Moisture Content	ontent	*	12.1	13.5	11.0	12.2	
Field Density		gr/cm <sup>3</sup>	1.92	1,92	1.96	1.93	
Compaction Degree	Degree	×	66	66	101	56	295

TABLE 6 MODEL NO. 6 SBST: SUBBASE COURSE, h = 12 cm

Left Lane	Lane		AUT JAUAA MAJI M C.T				
Chainage Test Items	e B B B B B B B B B B B B B B B B B B B		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100	. 100	100	100	100
% Passing	25	900 2000 2000	81	66	88	87	52 - 85
a Sieve	9.5	24 H H	73	84	17	78	40 - 75
	0.425 mm %	200	32	23	26	27	ł
	0.075 mm X	am X	10	11	11	11	0 - 12
Moisture Content	ontent	ж	16.1	15.1	16.0	15.7	
Field Density		gr/cm <sup>3</sup>	1.98	1.97	2.02	1.99	
Compaction Degree	Degree	×	102	101	104	102	>95

Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	8 8 8		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	k K	100	100	100	100	100
% Passing	25	mm X	84	85	18	83	55 - 85
a Sieve	9.5	2 11	74	75	75	75	40 - 75
	0.425	200	33	19	17	23	ı
	0.075	0.075 mm %	10	5	9	89	0 - 12
Moisture Content	ontent	*	16.0	16.3	16.2	16.2	
Field Density	i ty	gr/cm <sup>3</sup>	1.96	1.92	2.04	1.97	
Compaction Degree	Degree	ж	101	66	105	102	>95

8-11 (3)

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TABLE 7

Left	Left Lane		1.5 m fr	1.5 m from Center Line	Pine		
Chainage Test Items	ge ens		0 + 0	0 + 20 0 + 100 0 + 0	0 + 150	Average	Spec.
Grading: X Passing	50 50		100 82	100 65	100 80	100 69	100 55 - 85
a Sieve		× ua	22	60	72	62	40 - 75
	0.425 mm %	а Ш	25	37	11	24	1
	0.075 mm	X tutu	ю	ŝ	7	9	0 - 12
Moisture Content	Sontent	ж	12.6	11-2	10.3	11.4	
Field Density		gr/cm <sup>3</sup>	2.03	I.95	1.96	1.98	
Compaction Degree		×	105	101	101	102	>95

Right	Right Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e Bus		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	50	ж ше	100	100	100	100	100
% Passing	25	nn X	82	83	92	85	55 - 85
a Sieve	9.5	an X	73	70	86	76	40 - 75
	0.425	nn X	32	30	38	33	ı
	0.075	am X	60	9	Ø	7	0 - 12
Moisture Content	ontent	ж	9.2	12.8	15.2	12.7	
Field Density		gr/cm <sup>3</sup>	1.92	1.70	I.64	1.75	
Compaction Degree	Degree	ж	66	8.7	84	06	564
•	,						

TABLE 8 MODEL NO. 8 BMP: SUBBASE COURSE, h = 10 cm

Left Lane	Lane		17 W C.1	L.o m irom Center Line	Line		
Chainage Test Items	e ems		0 .+ 0	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	X EE	100	100	100	100	100
× Passing	25	ma X	77	78	06	82	55 - 85
a Sieve	9.5	2 5	67	68	76	70	40 - 75
	0.425	200 20	30	34	34	33	
	0.075		0	. 13	7	7	0 - 12
Moisture Content	ontent	×	11.2	12.1	12.6	12.0	
Field Density		gr/cm <sup>2</sup>		2.05	1.95	1.97	
Compaction Degree	Degree	*	66	106	101	102	>95

Right Lane	Lane		1-5 m fr	I.5 m from Center Line	Line		
Chainage Test items	e ems		0 +	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	к E	100	100	100	100	100
X Passing	25	7 mm 2	63	16	76	87	55 - 85
a Sieve	9.5	× 68	83	18	66	17	40 - 75
	0.425	2 HU	38	36	30	35	
	0.075	100 X	6	<del>10</del>	00	80	0 - 12
Moisture Content	ontent	ж	12.6	11.6	10.1	11.4	
Field Density		gr/cm <sup>3</sup>	I.86	1.38	1.94	1.85	
Compaction Degree	Degree	X	36	16	100	98	595

8 - 11 (4)

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TABLE 9	

Left Lane	Lane		1.5 m fr	I.5 m from Center Line	116		
Chainage Test Items	e B B B B B B B B B B B B B B B B B B B		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	e e	100	100	100	100	100
× Passing	25	2	16	82	- 62	83	55 - 85
a Sieve	9.5	а Ш	82	74	72	76	40 - 75
	0.425 mm %	, Mai	42	34	33	36	1
	0.075 mm %	т. К	18	11	11	13	0 - 12
Moisture Content	ontent	х	11.4	10.1	10.7	10.8	
Field Density		gr/cm <sup>3</sup>	2.10	2.04	1.93	2.02	
Compaction Degree	Degree	х	108	105	100	104	>95

from Center Line
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Right Lane

Chainage Test ltems	e ems		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	× 58	100	100	100	100	100
% Passing	25	X He	94	82	78	85	55 - 85
a Sieve	9.5	X EG	75	74	70	73	40 - 75
	0.425	X Bu	36	33	32	34	ŀ
	0.075 mm %	mm X	11	cn	ಜ	6	0 - 12
Moisture Content	ontent	×	16.3	6.11	0.6	12.4	
Field Density		gr/cm <sup>3</sup>	1.94	2.04	2.14	2.04	
Compaction Degree	Degree	×	100	105	110	105	295

TABLE 10 MODEL NO. 9 DBST: SUBBASE COURSE, h = 30 cm 2nd Layer, h = 15 cm

Left Lane	ane		1.5 m fr	I.5 m from Center Line	9117		
Chainage Test Items	ems		0 ÷ 20	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	50	к Ш	100	100	100.	100	100
% Passing	25	11111 X	32	78	70	77	55 - 85
a Sieve	9.5	nin X	69	69	62	67	40 - 75
	0.425	ж Ш	30	29	28	29	1
	0.075	mm X	υ	4	ശ	ŝ	0 - 12
Maisture Content	ntent	х	7.0	12.0	12.3	10.4	
Field Density		gr/cm <sup>a</sup>	2.08	2.00	1.98	2.02	
Compaction Degree	Dorree	*	107	103	τ <b>υ</b>	104	295

Right Lane	Lane			1.5 m fr	I.5 m from Center Line	Line		
Chainage Test Items	SE			0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	* 50	×	100	100	100	100	100
% Passing	25	E	×	85	63	79	78	55 - 85
a Sieve	9.5	Ê	×	73	62	72	63	40 - 75
	0.425	E E	×	32	26	30	29	ı
	0.075	Ē	×	89	4	4	ល	0 - 12
Moisture Content	ontent		×	6.5	13.5	9.8	<b>6</b> .6	
Field Density		gr/cm <sup>3</sup>	n E	2.39	1.96	2.11	2.15	
Compaction Degree	Degree		×	123	101	109	111	>95

8 - 11 (5)

Left Lane	1.5 m f1	m from Center Line	Line			Left Lane	ле	1.5 g f	m from Center Line	Line		
Chainage Test Items	0 + 20	0 + 100	0 + 150	Average	Spec.	Chainage Test Items	Δ	0 + 50	0 + 100	0 + 150	Average	Spec.
шш 0 С С С	100	100	100	100	100		÷.		100	100	100	8
X Passing 25 mm X a Sieve 9.5 mm X	87 79	81 75	78 72	82 75	55 - 85 40 - 75	% Fassing a Sleve	25 mm x 9.5 mm x	35	75 64	87 81	82 72	55 - 85 40 - 75
0.425 mm ×	38	36	33	36			۲D C		53	36	32	÷
75 mm	12	12	10	11	0 - 12		0.075 пл 2		9	2	7	0 - 12
Moisture Content % Biald Dansity or/cm <sup>3</sup>	16.4 1 21	13.8	12.9 1 a1	14.4		Moisture Content Field Density	tent z z	<ul> <li>15.1</li> <li>3</li> <li>3</li> <li>4</li> <li>9</li> </ul>	16.4	14.4	15.3	
sree	70.7 63	3 E . T 6 6	72.7 86	97. 97	>95	Compaction Degree			Ç0	94	1.04 95	>95
Right Lane	1, L 1, L 11	m from Center Line	Line			Right Lane	ane	4 6 19 1	m from Center Line	Line		
Chainage Test Items	0 + 50	0 + 100	0 + 150	Average	Spec.	Chainage Test Items	<u>v</u>	0 + 50	0 + 100	0 + 150	Average	Spec
50 10 10	100	100	100	100	8		an An		100	100	- 100	8
a Sieve 9.5 mm 2	10	00 76	co	74	55 - 65 40 - 75	a Sieve		× ×	62 0	69 1	63	40 - 75
0.425 mm %	33	33	32	34	ı		0.425 mm %		28	29	28	
0.075 mm % Moisture Content %	11 17 F	10 13 E	10 13 6	10 13 A	0 - 12	0.0 Maisture Cantent	0.075 mm 2 tent 22	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 0 1	- 5 -	ים יים יים	0 + 12
gr/c	2.06	1.97	1.87	1-97		Field Density	gr/			1.82	1.88	
Compaction Degree z	106	007	20	1	207	Commantion Degree		2		è	tc	207

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Left Lane	ane			1.5	۳ ۲	1.5 m from Center Line	r Line		
Chainage Test Items	SE			+	50	001 + 0	0 + 20 0 + 100 0 + 150	Average	Spec.
Grading:	50	E K K		100		100	100	100	100
% Passing	25	N WE		80	~	77	70	76	52 - 85
a Sieve.	9.5	2 UU		74		73	60	63	40 - 75
	0.425	200		35		35	30	33	•
	0.075 mm	E N N				n	2	<del>с</del>	0 - 12
Moisture Content	ntent	×		ï	13.6	15.1	11.4	13.4	
Field Density		gr/cm <sup>3</sup>	6		1.85	2.05	16.1	1.94	
Compaction Degree	Degree	×		95	10	106	38	100	>95

Right Lane 1.5 m from Center Line

Chainage Test Items	SE		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	an X	100	100	100	100	100
% Passing	25	me X	78	55	80	71	55 - 85
a Sieve	9.5	X ma	68	38	71	59	40 - 75
	0.425	2 E E	32	35	33	33	r
	0.075 mm	X AUE	2	œ	2	4	0 - 12
Moisture Content	ontent	ж	11.7	10.3	16.4	12.8	
Field Density		gr/cm <sup>3</sup>	1.81	1.92	1.90	1.38	
<b>Compaction Degree</b>	Degree	×	93	66	66	41	>95

TABLE 14 MODEL NO. 12 AC 5 cm: SUBBASE COURSE, h = 6 cm

Left Lane	Lane		1.5 m fr	I.5 m from Center Line	Line		
Chainage Test Items	e e as		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec
Grading:	50	к Ш	100	100	100	100	100
% Passing	25	<b>DG X</b>	70	76	17	74	55 - 85
a Sieve	9.5	20 X	. 99	67	68	67	40 - 75
	0.425	200	32	32	32	32	ı
	0.075 mm %	2 M M 2	ო	67	17	2	0 - 12
Moisture Content	ontent	х	13.8	11.0	8.5	1.11	
Field Density		gr/cm <sup>3</sup>	2.04	1.90	2.40	2.11	
Compaction Degree	Degree	*	105	<u> 3</u> 8	124	109	>95

Right	Right Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e e sas		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	50	X He	100	100	100	100	100
% Passing	25	<b>MR</b> %	81	62	85	75	55 × 85
a Sieve	9.5	R R R	72	56	73	67	40 - 75
	0.425	2 111 ×	33	27	33	31	•
	0.075 mm	5 1111 2	2	7	10	4	0 - 12
Moisture Content	ontent	х	12.2	14.4	11.1	12.6	
Field Density	ity	gr/cm <sup>3</sup>	1.85	1.98	2.01	1.95	
Compaction Degree	Degree	ж	96	102	104	100	>95

8-11 (7)

TABLE 16 MODEL NO. 14 BMP: SUBBASE COURSE, h = 16 cm

.

Left Lane	cane	1	1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	ഗ ല ഖ ല		0 + 0	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	50	× E	100	100	100	100	100
% Passing	25	X 100	33	84	81	35	55 - 85
a Sieve	9.5	とは日	88	76	73	52	40 - 75
	0.425	и И	i	1	1	ı	•
	0.075	2000 2	თ	9	7	7	0 - 12
Moisture Content	ontent	х	16.5	13.0	14.2	14.6	
Field Density		gr/cm <sup>a</sup>	1.77	2.02	1.95	16.1	
Compaction Degree	Degree	х	16	104	IOI	55	585

Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		-
Chainage Test Items	e Base Selare Se		0 + 50	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	20 ·	т ц ц ц	100	100	100	100	100
% Passing	25	mm X	85	83	83	84	55 - 85
a Sieve	9.5	2 00	75	74	74	74	40 - 75
	0.425 mm %	X EU	1	t	,	1	۱
	0.075 mm X	X EQ	ტ	9	7	7	0 - 12
Moisture Content	ontent	х	12.8	11.7	11.2	11.7	
Field Density		gr/cm <sup>3</sup>	1.75	2.11	2.00	1.95	

×95

101

103

109

90

×

Compaction Degree

Left Lane		1.5 m fr	from Center Line	Line		
Chainage Test Items		05 + 0	0 + 100	0 + 150	Average	Spec.
Grading: 50	X UE	100	100	100	100	100
× Passing 25	ž	19	73	86	61	55 - 85
a Sieve 9.5	5 1111 2	70	64	78	. 11	40 - 75
0.	0.425 mm Z	ı	1	,	1	ı
0.	0.075 mm Z	4	თ	12	5	0 - 12
Moisture Content	r *	13.6	11.8	10.4	11-9	
Field Density	gr/cm <sup>3</sup>	2.08	2.19	2.13	2.13	
Compaction Degree		107	113	110	110	>96
Right Lane		1.5 m fr	from Center	Line		
Chainage Test Items		0 ÷ 0	0 + 100	0 + 150	Average	Spec.
Grading: 50	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100	100	100	100	100
% Passing 25	X EU	88	82	80	83	55 + 85
a Sieve 9.5	5 mm X	80	72	73	75	40 - 75
0.	0.425 mm %	ı			,	•
.0	0.075 mm %	10	50	10	10	0 - 12
Moisture Content		12.2	12.4	9.6	11.4	
Field Density	gr/cm <sup>3</sup>	1.94	2.00	2.10	2.01	
Compaction Degree		100	103	108	104	>95

Left Lane	Lane		1.5 m fr	m from Center	Line		
Chainage Test Ite	age Items		0 + 20	0 + 100	0 + 150	Average	Spec
Grading:	50		100	100	100	100	100
z Passing a Sieve	25 9 . 5	X X E E	<b>8</b> 2	22 06	16	16 76	68 - 66 40 - 75
	0.425	E	37	34	20	30	1
	0.075		12	8	6	10	1 0
Moisture Content	ontent	м	4.5	5.8	4.5	4.9	
Field Density	ity	gr/cm <sup>3</sup>	2.05	2.06	2.13	2.08	
Compaction Degree	Degree	×	106	106	110	107	595
Right	Right Lane		1.5 m fr	from Center	Line		
Chainage Test Items	e ems		0 + 20	0 + 100	0 + 150	Average	Spec.
Grading:	50	N EE	100	100	100	100	100
% Passing	25	2	85	83	11	86	55 -
a Sieve	9.5	nn x	71	63	80	73	40 -
	0.425		33	31	38	34	1
	0.075	2 10 2	11	თ	12	11	- 0
Moisture Content	ontent	х	5.9	5.8	5.8	5.8	
Field Density	ity	gr/cm <sup>3</sup>	2.07	2.27	2.17	2.17	

Left Lane		1.5 m fr	from Center	Line		
Chainage Test Items		0 + 20	0 + 100	0 + 150	Average	Spec.
Grading: 50 mm	ж	100	100	100	100	100
% Passing 25 mm	×	80	68	52	76	52 - 85
a Sieve 9.5 mm	*	67	65	78	. 70	40 - 75
0.425 mm	X	•	1	ı	ı	,
0.075 mm	×	8	12	60	6	0 - 12
Moisture Content	N	11.5	14.4	12.8	12.9	
Field Density gr/	gr/cm <sup>3</sup>	2.00	1.82	1.77	1.86	
Compaction Degree	м	103	94	16	96	>95
Right Lane		1.5 m fr	from Center	Line		
Chainage		0 + 20	0 + 100	0 + 150	Average	Spec.
Test Items						
Grading: 50 mm	ж	100	100	100	100	100
% Passing 25 mm	×	76	78	85	80	55 - 85
a Sieve 9.5 mm	*	71	74	82	75	40 - 75
0.425 mm	×	١	ı	r	ı	1
0.075 mm	*	60	11	10	10	0 - 12
Moisture Content	×	12.3	15.3	13.1	13.6	
Field Density gr/	gr/cm <sup>3</sup>	2.02	1.81	1.90	16.1	
Commartion Degree	;					

8-11 (9)

Left Lane	l.5 m fr	m from Center Line	Line			Left Lane	н	1.5 m froi	m from Center Line	Line		
Chainage Test Items	0 + 50	0 + 100	0 + 150	Average	Spec.	Chainage Test Items	0	+ 50	0 + 100	0 + 150	Average	Spec.
50 88 88	100	100	190	100	100	Grading: 50 m	1 2 2 2 2	100	100	100	100	100
a Sieve 9.5 mm 2.	75	0.88	87 81	91 81	55 = 85 40 = 75	6°2	× × E	01 72	72	63	2 G G	55 - 55 40 - 75
0.425 mm X	32	38	36	35	ı	0.425 m	<b>THEN X</b>	17	21	16	18	ı
0.075 mm X	2	ው	5	60	0 - 12	0.075 1	2 E	ø	11	7	60	0 - 12
Moisture Content x Field Density gr/cm <sup>3</sup>	14.1 1.77	14.3 1.70	16.5 1.65	15.6 1.71		Moisture Content Field Density gr	% gr/cm <sup>3</sup>	5.1 2.15	4.6 2.11	5.7 2.10	5.5 2.12	
ree	16	88	85	88	>95	ree	ж	111	109	108	1.07	>95
Right Lane	1.5 m fr	1.5 m from Center Line	Line			Right Lane		1.5 m fro	m from Center Line	Line		
Chainage Test Items	0 + 20	0 + 100	0 + 150	Average	Spec.	Chainage Test Items	0	0 + 50	0 + 100	0 + 150	Average	Spec.
	100	100	100	100	100	50		100	100	100	100	100
x Passing 25 mm x	87	76	70	78	55 - 85	Z Passing 25 n	25 X	87	35	89	87	55 - 85
a Sieve 9.5 mm x	83	68	62	11	40 - 75	аSieve 9.5 п	N LIU	70	58	12	55	40 - 75
0.425 mm X	36	29	27	31	ı	0.425 5		15	20	32	22	1
0.075 mm x	7	£	ശ	9	0 - 12	0.075 п	11 X	4	9	0	7	0 - 12
'nt	13.9	8.8	9.8	10.8		th th	ж	5.0	2.8	3.8	3.9	
Field Density gr/cm <sup>3</sup>	1.84	1.84	1.73	1.80			gr/cm <sup>3</sup>	2.25	2.27	2.20	2.24	
Control is a located of			•		•	Compaction Dowese	2		i			

8 - 11 (10)

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Left Lane		1.5 m fi	m from Center Line	r Line				Left Lane	ane		l.5 m fro	1.5 m from Center Line	Line			
Station Test ftems	0	+ 025 0	+ 075 0	125	0 + 175	Average	Spec.	Station Test Items	SE	-	0 + 025 0	+ 075 0	+ 125	0 +175	Average	Spec.
Grading: 50 X Passing 25	ж ж Е е	100 83	100 78	100	100	100	100	Grading: % Passing	50 · 25		100 81	100 85	100 82	100 80	100 82	100 55 - 85
u		65	61	62 62	64 64		33 - 63 40 - 75	a Sieve	9.5		60	60	64	61		I.
0.425	0.425 mm X	22	20	20	24	22	1		0.425		24	и 1 1 2 3 1 1 1 2 3 1 1 1 1 2 3 1 1 1 1 1	20	22	22	1 1
Moisture Content	2 X E	8.8	11	8 8 5	0.0 9.0	12 8.8	. 12	Moisture Content	o.v.o mtent	x x	8.7	8.4	5°3	8.6 8	3 8 8	
Field Density	gr/cm <sup>3</sup>	2.000						Field Density		gr/cm <sup>a</sup>	2.039				2.039 2.	2.049
Compaction Degree		101	105	102	104	103	>95	Compaction Degree	Degree	×	103	106	102	103	104	>95
Right Lane		1.5 m fl	1.5 m from Center Line	r Line				Right Lane	Lane		1.5 m fro	1.5 m from Center Line	Line			
Station Test Items	Ö	+ 025 0	+ 075 0	+ 125	0 + 175 /	Average	Spec.	Station Test liems	SEL	0	0 + 025 0	+ 075 0	+ 125 0	+ 175	Average	Spec.
Gading: 50	RE RE	100	100	001	100	100	100	Grading:	50	Ĕ	100	100	100	100	100	100
1g 2	X EE	87	75	88	84	84	55 - 85	% Passing	25	am X	80	80	92	81		+
a Sieve 9.5	E	60	62	72	66	65	40 - 75	a Sieve	9.5	× ma	59	65	66	59		40 - 75
0.425	2 mm X mm X	20	26	22	23	23	ı		0.425	mm X	19	22	20	50	23	
0.075	Ē	13	12	14	12	13	0 - 12		0.075	0.075 mm ×	12	11	13	12	12	0 - 12
Moisture Content Field Possifie	× "	10.2	9.2	9.0	10.3	9.7	ć	Moisture Content Field Dessity		5 / Cm <sup>3</sup>	5.8 1 FE	10.4 2 044	6.8 2 100	6.5 2 010	9.8 2 105	
Compaction Degree		1.961	-	103	1	,	10 295	Compaction Degree		220	105	103	111	102	- H	>95

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8-11 (11)

TABLE 24 MODEL NO. 3 DBST : BASE COURSE, h = 15 cm

TABLE 23 MODEL NO. 2 SBST : BASE COURSE, h = 15 cm

Left Lane	Lane		1.5 m fr	5 m from Center Line	Line		!	Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line
Chainage Test Items	e ems		0 + 20	0 + 100	+ 50 0 + 100 0 + 150 Average	Average	Spec.	Chainage Test Items	e ms		0 + 20	0 + 50 0 + 100 0 + 1	1+0
Grading:	37.5	K EE	100	100	100	100	100	Grading:	37.5	mm X	100	100	100
% Passing		80 X	69	79	71	73	60 - 85	% Passing	19	200	71	74	67
a Sieve	4.75		46	51	44	47	30 - 55	a Sieve	4.75	nm X	55	58	49
	0.425 mm	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	13	22	IS	17	8 - 25		0.425	0.425 mm %	21	21	19
	0.075	0.075 mm ×	9	13	ø	თ	2 - 14		0.075	0.075 mm X	10	12	11
Moisture Content	ontent	*	12.9	10.5	7.1	10.2		Moisture Content	ontent	ж	10.5	12.5	12.
Field Density	ity	gr/cm <sup>3</sup>	1.92	I,92	1.94	1.93		Field Density		gr/cm <sup>3</sup>	1.94	1.95	Ļ.
Compaction Degree	Degree	*	66	66	100	66	>100	Compaction Degree	Degree	×	100	101	100
Prime Coat		lit/m²	1.11	1.08	1.12	1.10	1.20	Prime Coat		11t/m²	0.92	0.98	0

60 - 85 30 - 55 8 - 25 2 - 14

100 54 11

100 67 49 19 11 12.5 1.94

100

Spec.

0 + 150 Average

>100 1.20

100 0.92

0.85

100

1.94

11.9

Line	
1.5 m from Center Line	
from	
1.5 =	
Right Lane	

Chainage Test Items			0 + 50	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	37.5	2 E E	100	100	100	100	100
× Fassing	19	2 (UU	76	74	53	68	60 - 85
a Sieve	4.75	mm X	53	52	37	47	30 - 55
	0.425 mm %	X EU	18	19	12	16	8 - 25
	0.075	z ma	თ	10	2	сл	2 - 14
Moisture Content	ontent	х	10.7	11.6	10.9	11.1	
Field Density		gr/cm <sup>a</sup>	1.98	2.00	1.96	1.98	
Compaction Degree		х	102	EOI	101	102	>100
Prime Coat		lit/m²	1.08	1,23	1.11	1.15	1.20

60 - 85 30 - 55 8 - 25 2 - 14

100 82 63 24 10 12.6

100 93 93 31 12 130 130

თ 50 16

100 87 66 26 10 11.7 1.98 102 1.19

Grading: 37.5 mm % % Passing 19 mm % a Sieve 4.75 mm % 0.425 mm % Moisture Content %

100

100 67

Spec.

0 + 150 Average

0 + 100

0 + 50

Test Items Chainage

I.5 m from Center Line

Right Lane

>100 1.20

1.97 102 1.20

13.1 2.00 103 1.26

1.16

lit/m²

×

Compaction Degree

Prime Coat

Field Density gr/cm<sup>3</sup>

## 8-11 (12)

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1.5 m from Center Line	
Left Lane	

Chainage Test Items	Suis		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	א שש	100	100	100	100	100
% Passing	19	5 H H H H H H H H H H H H H H H H H H H	83	65	71	52	60 - 85
a Sieve	4.75	mm X	49	49	51	47	30 - 55
	0.425	2 EU	18	17	24	20	8 - 25
	0.075	X mm	6	12	t-	6	2 - 14
Moisture Content	ntent	*	12.8	14.6	12.4	13.3	
Field Density		gr/cm <sup>3</sup>	1.96	1.98	1.96	1.97	
Compaction Degree	Degree	ж	101	102	101	101	>100
<b>Prime Coat</b>		lit/m²	1.24	1.22	1.26	I.24	

Right Lane 1.5 m from Center Line

						•	
Chainage Test Items	e ens		0 + 20	0 + 50 0 + 100 0 + 150	0 + 150	Average	Spec.
Grading:	37.5	2 MM	100	100	100	100	100
% Passing	19	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	68	06	73	77	60 - 85
a Sieve	4.75	20 N N N N N N N N N N N N N N N N N N N	53	47	51	50	30 - 55
	0.425	N mm X	23	21	19	21	8 - 25
	0.075	S mm S	9	19	12	<del>о</del>	2 - 1
Moisture Content	ontent	х	13.8	13.4	13.4	12.6	
Field Density	i ty	gr/cm <sup>3</sup>	1.94	2.02	1.96	1.97	
Compaction Degree	Degree	ж	100	104	101	102	0014
<b>Prime Coat</b>		lit/m²	1.24	0.99	0.88	1.04	1.20

TABLE 26 MODEL NO. 6 SBST: BASE COURSE, h = 15 cm

Left Lane	Lane		l.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	හ හ ම ම		+ 50	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100	100	100	100	100
% Passing	19	800 X	85 85	84	34	84	60 - 85
a Sieve	4.75	2 ma	58	52	52	54	30 - 55
	0.425 mm %	2000	20	20	22	11	8 - 25
	0.075	an X	11	10	12	11	2 - 14
Moisture Content	ontent	х	2.8	3.9	3.6	3.5	
Field Density		gr/cm <sup>3</sup>	2.29	2.30	2.30	2.30	
Compaction Degree	Degree	×	100	101	101	101	>100
Prime Coat		lit/m²	1.15	1.21	1.19	1.18	1.20

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Chainage Test Items	SEA		0 2 0 + 0	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	37.5	× E	100	100	100	100	100
z Passing	19		76	81	83	80	60 - 85
a Sieve	4.75	X BU	51	53	51	52	30 - 55
	0.425	10 11 12 12 12 12 12 12 12 12 12 12 12 12	18	20	20	19	8 - 25
	0.075	0.075 mm %	7	12	11	10	2 - 14
Moisture Content	ontent	х	3.8	4.1	3.6	3.8	
Field Density		gr/cm <sup>3</sup>	2.21	2.28	2.26	2.22	
Compaction Degree	Degree	*	93	100	66	66	>100
Prime Coat		[it/m²	1.20	1.10	1.25	1.18	1.20

8 - 11 (13)

TABLE 27 MODEL NO. 7 DEST : BASE COURSE, h = 15 cm

Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line	:	
Chainage Test Items	e ems		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	N EE	100	100	100	100	100
× Passing	19	2 <b>8</b> 0	86	76	88	83	60 - 85
a Sieve	4.75	X WU	51	34	59	46	30 - 55
	0.425	M N	17	80	19	15	8 - 25
	0.075	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	17	60	19	15	2 - 14
Moisture Content	ontent	X	2.4	3.7	5.4	3.8	
Field Density		gr/cm <sup>3</sup>	2.28	2.47	2.19	2.51	
Compaction Degree	Degree	×	126	108	96	110	>100
Prime Coat		1it/m²	1.29	1,18	1.20	1.22	1.20

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1.5 m from Center Line	
Right Lane	

Chainage Test Items	SIL		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	mm X	100	100	100	100	100
X Passing	19	z mm	87	74	80	80	60 - 85
a Sieve	4.75	Mm X	51	42	48	47	30 - 55
	0.425 mm z	mm X	11	13	16	13	8 - 25
	0.075 mm ×	שש א	~>	7	•	9	2 - 14
Moisture Content	ntent	ж	2.4	4.2	5.1	3.9	
Field Density		gr/cm <sup>3</sup>	2.33	2.37	2.23	2.31	
Compaction Degree		*	102	104	98	101	>100
Prime Coat		lit/m²	1.14	1.20	1.27	1.20	1,20

TABLE 28 MODEL NO. 8 BMP : BASE COURSE, h = 15 cm

Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e B B B B B B B B B B B B B B B B B B B		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	× E	100	100	100	100	100
% Passing	19	20 C	84	84	81	83	60 - 85
a Sieve	4.75	800 X	51	53	46	50	30 - 55
	0.425 mm	N EEE	17	22	16	18	8 - 25
	0.075 лп Х	201	8	11	¢	8	2 - 14
Moisture Content	ontent	×	3.6	4.5	3.8	4.0	
Field Density		gr/cm <sup>3</sup>	2.43	2.42	2.45	2.44	
Compaction Degree	gree	×	107	105	106	110	>100
Prime Coat		lit/m²	1.14	1.21	1.23	1.19	1.20

Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	a sue		05 + 0	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	× E	100	. 100	100	100	100
% Passing	19	24 HE	82	82	84	83	60 - 85
a Sieve	4.75	X UU	47	49	54	50	30 - 55
	0.425 mm %	X	18	17	23	19	8 - 25
	0.075 mm %	80 K	თ	თ	12	10	2 - 14
Moisture Content	ontent	×	4.1	3.6	5.0	4.0	
Field Density		gr/cm <sup>3</sup>	2.46	2.47	2.43	2.45	
Compaction Degree		×	108	108	107	107	>100
Prime Coat		lit/m²	1.15	1.21	I.26	1.22	1.20

8 - 11 (14)

TABLE 30 MODEL, NO.10 BMP BASE COURSE, h = 15 cm

TABLE 29 MODEL NO. 9 DBST : BASE COURSE, h = 15 cm '

Left Lane		1.5 m fr	1.5 m from Center	Line			Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items		0 2 0 + 0	0 + 50 0 + 100	0 + 150	Average	Spec.	Chainage Test Items	មាន ក្រុម ក្រាម ក្រម ក្រម ក្រាម ក្ ក ក្ម ក ក្ម ក ក្ម ក ក្ម ក ក្ ក ក ក្ ក ក្ ក ក ក្ ក ក្ ក ក ក្ ក ក្ ក ក ក្ ក ក ក ក ក ក្ ក ក្ ក ក ក្ ក ក ក្ ក ក្ ក ក ក ក ក្ ក ក ក្ម ក ក្ម ក ក្ម ក ក ក ក		0 + 20	001 + 0	0 + 50 0 + 100 0 + 150 Average	Average	
Grading: 37	37.5 mm %	100	100	100	100	100	Grading:	37.5 m	1013 X	100	100	100	100	
% Passing 19	1 mm X	06	16	16	16	60 - 85	% Passing			90	63	89	68	φ
	4.75 mm %	65	19	68	65	30 - 55	a Sieve	4.75 m	к К	55	61	55	57	3
0	0.425 mm %	24	21	22	23	8 - 25		0.425 mm %	ž	19	20	18	19	
0	0.075 mm %	11	თ	7	6	2 - 14		0.075 mm 2	200 2	<del>0</del>	თ	8	თ	
Moisture Content	ant x	2.9	5.4	3.2	3.8		Moisture Content	ontent	ж	8.0	3.9	3.2	5.1	
Field Density	gr/cm <sup>a</sup>	2.08	2.18	2.09	2.12		Field Density		gr/cm <sup>3</sup>	2.47	2.39	2.35	2.49	
Compaction Degree	gree %	16	96	55	63	>100	Compaction Degree	Degree	х	108	105	103	105	
Prime Coat	lit/m²	1.18	1.28	1.03	1.16	1.20	<b>Prime Coat</b>		lit∕m²	1.27	1.19	1.23	1.23	

60 - 85 30 - 55 8 - 25 2 - 14

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>100 1.20

Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e ems		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Arading:	37.5	Ř	100	100	.100	100	100
% Passing	19	ж шш	93	63	94	63	60 - 85
a Sieve	4.75	N WE	61	63	65	63	30 - 55
	0.425	0.425 mm X	21	22	23	22	8 - 25
	0.075	0.075 mm X	6	11	10	10	2 - 14
Maisture Content	ontent	*	4.1	3.6	5.0	4.0	
Field Density		gr/cm³	2.22	2.26	2.24	2.24	
Compaction Degree		х	57	66	66	96	>100
Prime Coat		lit∕m²	1.11	1.18	1 11	1.13	1.20

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8 - 11 (15)

TABLE 31 MODEL NO.11 AC 4cm BASE COURSE, h = 12 cm

Left Lane	03		1.	1.5 m from Center Line	om Cen	ter	Line		
Chainage Test Items			0	+ 50	1 + 0	00	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading: 37	37.5	n me		100	100		100	100	100
X Passing 19	-	Ë		<b>3</b> 8	88		88	89	60 - 85
a Sieve	4.75	800 X		61	53		53	56	30 - 55
)	0.425 mm %	к Е		21	18		19	19	8 - 25
0	0.075 mm	A EIE		5	ø	-	6	5	2 - 14
Moisture Content	ent	×		4.5	3.6	9	3.7	3.9	
Field Density		gr/cm <sup>3</sup>	n_	2.09	2.	2.23	2.24	2.19	
Compaction Degree	gree	*		- 26	98		<b>38</b>	36	>100
Prime Coat	-	lit∕m²	N.,	1.23		1.19	1.23	1.22	I.20

1.5 m from Center Line	
Right Lane	

Chainage Test Items	ens ens		20 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	24 19	100	100	100	100	100
% Passing	19	X auu	16	68	06	06	60 - 85
a Sieve	4.75	X mm	57	50	53	55	30 - 55
	0.425	Z WW	17	16	18	18	8 - 25
	0.075	X uu	11	89	Ø	თ	2 - 14
Moisture Content	ontent	ж	4.5	4.1	6.3	5.0	
Field Density		gr/cm <sup>3</sup>	2.13	2.14	2.03	2.10	
Compaction Degree	ree	×	94	94	89	62	>100
<b>Prime Coat</b>		lit/m²	1.16	1.18	1.14	1.16	1.20

TABLE 32 MODEL NO.12 AC 5cm : BASE COURSE, h = 12 cm

Left Lane	Cane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	හ සි.ස		0 + 50	001 + 0	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	2 19 19	100	100	100	100	100
% Passing	19	10.01 X	16	89	. 37	89	60 - 85
a Sieve	4.75		59	54	57	57	30 - 55
	0.425		20	20	19	20	8 - 25
	0.075	1 mm X	10	c,	10	10	2 - 14
Moisture Content	ontent	N	4.5	3.3	4.4	4.1	
Field Density		gr/cm <sup>3</sup>	2.25	2.28	2.39	2.31	
Compaction Degree	Degree	*	66	100	105	105	>100
Prime Coat		lit/m²	1.17	1.19	1.18	1.18	1.20

Right Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	SW		0 ÷	0 + 100	0 + 50 0 + 100 0 + 150 Average	Average	Spec.
Grading:	37.5	10 10 10 10 10 10 10 10 10 10 10 10 10 1	100	100	100	100	100
% Passing	19	2010 2	16	83	26	89	60 - 85
a Sieve	4.75	80 X	59	54	57	57	30 - 55
	0.425	200	20	20	19	20	8 - 25
	0.075	0.075 mm ×	01	6	10	10	2 - 14
Moisture Content	ntent	<b>X</b>	4.5	3.3	4.4	4.1	
Field Density		gr/cm <sup>3</sup>	2.25	2.28	2.39	2.31	
Compaction Degree	Degree	х	65	100	105	101	001<
Prime Coat		lit∕m²	0.96	1,29	1.34	1.20	1.20

8 - 11 (16)

TABLE 34 MODEL NO.14 BMP : BASE COURSE, h = 15 cm

0 + 20 0 + 100 0 + 150	0 + 20 0 + 100 0 + 150	Left Lane	1.5 m from Center Line	Center	Line	
		Chainage Test items	0 + 20 0	+ 100	0 + ISO	Averag

60 - 85 30 - 55 8 - 25 2 - 14 >100 1.20 Spec. 8 2.49 109 1.18 e e 100 87 53 18 18 10 3.6 100 84 54 19 10 3.7 2.56 112 0.95 4.2 2.51 110 1.26 100 92 51 21 11 8 3.2 2.39 105 1.30 100 84 48 15 15 х 11t/m<sup>2</sup> Field Density gr/cm<sup>3</sup> nn X × と言語 0.425 mm % 0.075 mm 2 4.75 mm X Compaction Degree 37.5 Moisture Content 13 Prime Coat % Passing Grading: a Sieve 

60 - 85 30 - 55 8 + 25 2 - 14 1.20 Spec. >100 100 2.48 109 0 + 50 0 + 100 0 + 150 Average 1.21 3.8 100 58 19 10 100 90 58 58 20 10 3.6 2.54 1.08 1.5 m from Center Line 100 91 59 59 20 11 3.7 2.57 113 1.30 4.2 2.23 102 1.24 100 89 18 38 0.425 mm × 0.075 mm × Field Density gr/cm<sup>3</sup> z lit/m² × × E E 4.75 mm X × Compaction Degree Moisture Content 37.5 19 Right Lane Test Items % Passing a Sieve Chainage Prime Coat Grading:

60 + 85 30 - 55 8 - 25 2 - 14 60 - 85 30 - 55 8 + 25 2 - 14 >100 1.20 >100 1.20 Spec. Spec. 100 100 101 1.18 0 + 50 0 + 100 0 + 150 Average 102 1.05 2.33 Average 2.31 100 86 54 19 8 6.1 4.9 TABLE 33 MODEL NO.13 DBST : BASE COURSE, h = 15 cm 100 88 54 18 18 0 + 1505.1 2.32 102 100 90 56 19 10 5.3 2.30 101 1.17 1.24 100 82 51 17 1.5 m from Center Line 1.5 m from Center Line 2.40 105 001 + 0 1.18 0.87 2.32 6.4 5.1 02 100 88 53 18 10 100 86 55 20 7 2.29 100 1.10 2.28 100 1.13 0 + 20 6.8 4.4 100 97 53 17 6 100 57 20 7 gr/cm<sup>a</sup> 0.425 mm % 0.075 mm % 4.75 mm x 0.425 mm x 0.075 mm × itent × lit/m² gr/cm<sup>3</sup> × K K K K K K Compaction Degree & Prime Coat lit/m<sup>2</sup> 4.75 mm % X Compaction Degree Moisture Content Moisture Content 37.5 37.5 Right Lane 61 Field Density 61 Field Density Left Lane Test Items Test Items Chai nage Chainage % Passing % Passing **Prime Coat** Grading: Grading: a Sieve a Sieve

TABLE 35 MODEL NO.15 AC 4cm : BASE COURSE, h = 15 cm

Left Lane	ane		l.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	SE		0 + 0	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	E K	100	100	100	100	100
× Passing	19	2 20	85	85	34	85	60 - 85
a Sieve	4:75	nn X	51	50	48	50	30 - 55
	0.425	nn X	18	17	17	17	8 - 25
	0.075 mm %		G	89	æ	ø	2 - 14
Moisture Content	ntent	X	4.5	3.8	3.9	4.1	
Field Density		gr/cm <sup>3</sup>	2.50	2.52	2.39	2.47	
Compaction Degree	Degree	ж	110	111	105	109	>100
Prime Coat		lit/m²	1.06	1.38	1.19	1.21	1.20

Right Lane	Lane		1.5 m from Center Line				
Chainage Test Items	SEQ		0 + 50	0 + 50 0 + 100 0 + 150	0 + 150	Average	Spec.
Grading:	37.5	2	100	100	100	100	100
× Passing	19	X	85	92	70	82	60 - 85
a Sieve	4.75	X Gu	53	56	40	50	30 - 55
	0.425 mm X	nm X	18	21	13	17	8 - 25
	0.075	ž	60	11	ۍ ۱	8	2 - 1
Moisture Content	ontent	х	3.8	3.1	3.9	3.6	
Fleld Density		gr/cm <sup>3</sup>	2.45	2.33	2.31	2.37	
Compaction Degree	Degree	×	108	102	101	104	>100
Prime Coat		lit/m²	1.29	1.33	1.05	1.22	1.20

TABLE 36 MODEL NO.16 AC 5cm : BASE COURSE, h = 15 cm

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Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	e e ms		0 + 20	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	100	100	100	100	100
% Passing	19	X E8	16	06	31	87	60 - 85
a Sieve	4.75	am X	70	66	28	65	30 - 55
	0.425	ma X	24	24	20	23	8 - 25
	0.075	20 M	80	12	8	ţ,	2 - 14
Moisture Content	ontent	×	11.4	8.5	10.3	10.1	
Field Density		gr/cm <sup>3</sup>	2.30	2.30	2.19	2.24	
Compaction Degree	Degree	×	101	101	<b>6</b> 6	65	>100
Prime Coat		lit/m²	1.31	1.11	0,99	1.14	1.20

Right Lane	מווגר		1.5 m from Center Line	הש הבזורבו			
Chainage Test Items			05 + 0	0 + 100	0 + 50 0 + 100 0 + 150	Average	Spec.
Grading:	37.5	2 EE	100	100	100	100	100
% Passing	19	N E	92	89	83	88	60 - 85
a Sieve	4.75		82	58	53	56	30 - 55
	0.425 mm	200 %	20	18	20	19	8 - 25
	0.075	20 X	10	5	¢	6	2 - 14
Moisture Content	ntent	×	4.1	5.6	7.7	5.8	
Field Density		gr/cm <sup>3</sup>	2.32	2.28	2.17	2.26	
Compaction Degree	Degree	×	101	101	96	104	>100
Prime Coat		11t/m²	1.30	1.24	1.22	1.22	1.20

8 - 11 (18)

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Left Lane	Lane		1.5 m fr	1.5 m from Center Line	Line			
Station Test Items	сшs		0 + 025 0 + 075 0 + 125 0 + 175 Average Spec.	- + 075 0	+ 125 0	+ 175	Average	Spec.
Grading:	37.5	RE RE	100	100	100	100	100	100
% Passing	19	2	70	73	87	70	75 6	60 - 85
a Sieve	4.75	nin X	38	37	42	36	38 3	30 - 55
	0.425 mm X	nm X	23	21	27	22	23	8 - 25
	0.075 mm %	× EE	13	14	15	13	14	2 - 14
Moisture Content	ontent	×	8.7	8.5	8.9	8.4	8.7	
Field Density		gr/cm <sup>3</sup>	2.308	2.203	2.266	2.203	2.245	
Compaction Degree	Degree	א	105	104	107	104	106	>100

1.5 m from Center Line Right Lane

.

Right	Right Lane		1-5 m \$	1.5 m from Center Line	r Line	. •		
Station Test Items	ems		0 + 025	0 + 025 0 + 075 0 + 125 0 + 175 Average Spec.	0 + 125	0 + 175	Average	Spec
Gradîng:	37.5	REE		100	100	100	100	100
z Passing	19	ž	71	74	72	85	16	60 - 85
a Sieve	4.75	nin X	43	40	41	57	45	30 - 55
	0.425 mm z	X EUU	21	20	23	24	22	8 - 25
	0.075 mm	nm X	12	34	13	14	13	2 - 14
Moisture Content	ontent	×	9.3	9.0	9.6	9.5	9.4	
Field Density		gr/cm <sup>3</sup>	2.331	2.220	2 181	2.287	2.255	5
Compaction Degree	Degree	х	110	105	103	108	107	>100

Left Lane	1.5 m fr	m from Center Line	Line			Left Lane	ane		1.5 m fr	1.5 m from Center Line	Line		
Chainage Test Items	0 + 20	0 + 100	0 + 150	Average	Spec.	Chainage Test Items	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		0 + 50	0 + 100	0 + 150	Average	Spec.
Grading: 25 mm %	100	100	100	100	100	Grading:	25	۲ ۳	100	100	100	100	100
% Passing 9.5 mm %	65	64	69	66	50 - 85	% Passing	9.5	2 M M M	62	62	66	63	50 - 85
a Sieve 4.75 mm %	57	ា ហ	57	56	35 - 65	a Sieve	4.75	<i>т</i> о 2	53	52	52	54	35 - 65
0.425 mm %	23	25	22	23	15 - 30		0.425	nn X	21	21	20	21	15 - 30
0.075 mm X	14	13	7	11	5 - 20		0.075	an X	13	12	9	10	5 - 20
Moisture Content 2	13.8	13.0	14.8	13.8		Moisture Content	ontent	×	5.5	4.5	3.8	4.6	
Field Density gr/cm <sup>3</sup>	1.92	1.96	1.92	1.93		Field Density		gr/cm <sup>3</sup>	2.53	2.60	2.41	2.51	
Compaction Degree %	001	102	100	101	>100	Compaction Degree		ж	107	110	102	106	>100
Right Lane	1.5 m fi	1.5 m from Center Line	Line			Right Lane	Ĺane		1.5 m fr	1.5 m from Center Line	Line		· .
Chai nage	0 + 50	0 + 100	0 + 150	Average	Spec.	Chai nage	61		0 + 50	0 + 100	0 + 150	Average	Spec.
Test Items						Test Items	ems						
Grading: 25 mm z	100	100	100	100	100	Grading:	25	8 8 1	100	100	100	100	100
% Passing 9.5 mm x	71	70	56	66	50 - 85	% Passing	9,5	X UU	10	, 59 ,	55	65	50 - 85
aSieve 4.75 mm x	58	57	47	54	35 - 65	a Sieve	4.75	100 X	57	55	45	52	35 - 65
0.425 mm ×	24	21	19	22	15 - 30		0.425		24	61	17	20	I5 - 30
0.075 mm X	11	10	ъ	10	5 - 20		0.075	0.075 mm ½	11	æ	7	თ	5 - 20
Moisture Content z	13.9	13.9	14.9	14.2		Moisture Content	ontent	*	4.2	4.3	3.8	4.1	
Field Density gr/cm <sup>3</sup>	1.98	2.04	1.94	1.99		Field Density		gr/cm <sup>3</sup>	2.62	2.48	2.45	2.52	
Compaction Degree X	52.5	201						;					•

8 - 11 (20)

TABLE 40 M	ON TEGO	MODEL NO. 2, No. 6: SBST (5 mm)	SBST (5)		SURFACE COURSE	SE	TABLE 42 MODEL NO	WODEL NO. 4, No. 8, No. 10, No. 14: BMP (50 mm) SURFACE COURSE	No. 10, 1	No. 14: 1	3MP (50 A	am) SURFA	CE COURSE
(Test results are mean value of 6 tests for each	n value o.	f 6 tests	for each	model)			(Test results are mean value of 6 tests for each	an velue of	6 tests	for each	model)		
Test Items		Design	Model	ei No. 2	Mode	Model No. 6	Test I tems		Design	Model	Model	Model	Model
Binder Spraying Rate										NO. 4	NO. 8	N0. 10	ND. 14
lst Layer k	kg/m²	1.4		1.38	•	1.43	Aggregate Spraying Rate	ate .					
Seal Coat k	kg/m²	1.0		1.14	+4	1.16	Base Layer (40-20 mm)	mm) kg/m²	80	81.3	84.4	85.3	82.9
Binder Total k	kg/m²	2.4		2.52	2	2.59	2nd Layer (20-10 mm)	mm) kg/m²	13	13.4	14.8	13.0	15.6
							3rd Layer (10- 5	mm) kg/m²	11	10.1	10.2	11.1	10.9
Aggregate Spreading Rate	ate						4th Layer (Sand)	kg∕m²	9	8.1	6.0	6.5	5.0
Chip (10-5 mm) k	kg/m²	14	1	14.48	14	14.09							
Seal Coat Sand k	kg/m²	8		8.08	9	6.22	Agregate Total	kg/m²	110	112.9	115.4	115.9	114.4
Aggregate Totai k	kg/m²	22	3	22.56	20	20.31	Binder Spraying Rate						
							Base Layer	kg/m²	2.7	2.73	2.76	2.44	2.61
							2nd Layer	kg/m²	1.8	1.81	1.77	1.87	1.78
							3rd Layer	kg/m²	1-5	1.42	1.48	1.52	1.29
TABLE 41 MODEL NO.	3, No. 7	MODEL NO. 3, No. 7, No. 9, No. 11: DBST	11: D		am) SURF.	(15 mm) SURFACE COURSE	Binder Total	kg/m²	6.0	5,96	6.01	5.83	5.63
(Test results are mean value of 6 tests for each	n value o	f 5 tests	for each	model)									
Test Items		Design	Model No. 3	Model No. 7	Model No.9	Model No. 13							
Binder Spraving Rate													
1st Layer	kg/m <sup>2</sup>	1.4	1.64	1.48	1.87	1.51	-						
2nd Layer	kg∕m²	1.2	1.34	1.2.1	1.26	1.31							
Seal Coat	kg/m²	1.5	1.29	1.41	1.38	1.46							

8 - 11 (21)

4.28

4.51

4.13

4.27

2.4

kg/m²

Binder Total

24.6 10.6 4.8

22.2 10.5 6.7

23.5 11.6 5.6

22.9 11.8 5.6

22 12 6

lst Chip (20-10 mm) kg/m<sup>2</sup> 2nd Chip (10- 5 mm) kg/m<sup>2</sup> Seal Coat Sand kg/m<sup>2</sup>

Aggregate Spreading Rate

40.4

39.4

40.7

40.3

<del>4</del>0

kg/m²

Aggregate Total

Test Results   Test Items	r No. AC-2	۶.	E S I	Test Results No. AC-2 h = 5 cm Asphalt Concrete Test Items Spec. Model	crete Model No. 11	Model No. 15
Mixing Laying Temperature °C Laver Thickness	ig Tempera	ture	υ	F	158	153
from Core Sample	ample		CB	ł	5.0	5.5
Core Density		12	gr/m <sup>3</sup>	ı	2.275	2.263
Compaction Degree	legree		×	264	98.6	- 97.7
Grading:	61	E	×	100	100	100
% Passing	4.75	ma	×	45 - 65	61	62
a Sieve	2.35	E	×	33 - 53	46	45
;	-	ШШ	*	10 - 20	13	12
	0.075 mm	Bu	×	3 - S	4	ŝ

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(Test results are mean value of 6 tests for each model) Test Results No. AC-1 h = 4 cm Asphalt Concrete

Test Items	S		Spec.	Model No. 11	Model No. 11 Model No. 15
Mixing Laying Temperature °C	ig Tempera	ature °C	•	156	149
Layer Thickness from Core Sample	tess ample	cm	1	4,3	4 10
Core Density		gr/m <sup>3</sup>	1	2.264	2.200
Compaction Degree	)egree	*	297	97.6	95.1
Grading:	19	K K K	100	100	100
x Passing	4.75	1000 X	45 - 65	61	63
a Sleve	2.36	mm X	33 - 53	46	45
	0.300	200 %	10 - 20	12	12
	0.075	800 %	80 - 10 10	4	4
Asphalt Content	ent	x	5.7	5.69	5.66

TABLE 44 MODEL NO. 12, No. 16: AC 5 CM SURFACE COURSE

TABLE 45-1 MODEL NO. 17: AC 5 cm SURFACE COURSE

(Marshail test results are mean value of 3 specimens for each sample)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2			Job-mix Tolerance	Sampie No. 1	Sample No. 2	Sample No. 3
Mixing Temperature °C	perature	Ş		129 - 149	149	149	149
Marshal Test Density	·	gr/cm <sup>3</sup>			2.457	2.451	2.452
Stability			41	>1,200	2,864	2,560	2,732
Flow	0	0.01	'n	8 - 16	12	10	12
Air Volds	ŝ		×	3 - 6	5.2	5.3	5.4
Void Filled	l ed		х	70 - 80	11	71	12
Asphalt Content *	ntent *			5.4 - 6.2	5.82	5.90	5.70
Grading:	19	E	×	100	100	100	100
% Passing	4.75	88	×	48 - 62	61	57	61
a Sieve	2.36	ma	×	39 - 47	46	44	45
	0.300 1	Ē	×	6I - II	13	14	17
	0.075 1	Ē	×	3 - 7	4	ເກ	ব

Sample No. 1, 2, 3: Date of Placing: Sept. 25, 1990 Location: L / Lane, Sia. 0 + 264 to 0 + 400 \* Percente by Weight of Total Aggregates Sample meets Job-mix requirements.

TABLE 45-2 MODEL NO. 17: AC 5 Cm SURFACE COURSE

(Marshall test results are mean value of 4 specimens for each sample)

lest items	SIIIS			Job-mix Tolerance	Sample No.4	Sample No. 5	Sample No. 6
Mixing Temperature °C	perature	C S		129 - 149	149	149	149
Marshal Test			6			1	
Density		gr/cm <sup>2</sup>	2		2.451	2.445	2.451
Stability 		3		8	2,797	2,427	2,758
FIOW		0.01		-1	14	- '	, ' ; '
Air Voids	es.		×	3 - 6	5.4	5.4	5.3
Void Filled	led		*	70 - 80	11	11	11
Asphalt Content	ntent *			5.4 - 6.2	5.87	6.00	5.94
Grading:	19	66	×	100	100	100	100
% Passing	4.75	66	*	48 - 52	61	60	51
a Sieve	2.36	88	×	39 - 47	43	45. 45	42
	0.300	80	х	11 - 19	19	12	61
	0.075	e E	X	3 - 7	ស	ស	Q

Location: L / Lane, Sta. 0 + 200 to 0 + 254 R / Lane, Sta. 0 + 290 to 0 + 400 Sample No. 5 : Date of Flacing: Oct. 5, 1990 k Percente by Weight of Total Aggregates Sample meets Job-mix requirements.

3.89 (564) 3.64 (529) 4.01 (582) Average 3.85 (558) 28 days, MPa (psi) 3.77 (546) 3.89 (564) 3.89 (564) Average 3.85 (585) 3.39 (492) 3.89 (654) 3.64 (529) Average 3.54 (529) 3.64 (529) 3.64 (529) 3.77 (546) 3.68 (535) Flexural Strength Average Slump **. .** . 555 e **က** က **ო** ო ŝ **က** က ¢3 က ŝ e Test No. No. 7 No. 5 No. 6 No. 8 Date of Placement Left Lane Sta. 0 + 000 Sept. 5, 1990 Sept. 6, 1990 Sta. 0 + 150 Sta. 0 + 150 Sta. 0 + 200 Left Lane Location \$ ç Ç

Remarks: Flexural Strength were tested by the third-point loading method.

Date of Placement	Test	Slump		Flexural S	Strength
Location	No.		28 d	days, M	MPa (psi)
Aug. 2, 1990	No. 1	2.5 in		4.75	(690)
Right Lane		3 in		3.89	(564)
Sta. 0 + 000		3 in		3.77	(546)
to			Average	4,14	(600)
Sta. 0 + 094.5					
	No. 2	2.5 in		4.01	(582)
		2.5 in		4.26	(618)
		2.5 in		4.14	(600)
			Average	4.14	(009)
Aug. 15, 1990	No. 3	2.5 in		4.25	(618)
Right Lane		3 in		4.51	(654)
Sta. 0 + 094.5		2.75 in		4.51	(654)
to Sta. 0 + 200			Average	4.43	(642)
	No. 4	3 In		4.87	(101)
		3 in		4.26	(618)
		3 in		4.39	(836)
			Åverage	4.51	(654)

TABLE 46-2 MODEL NO. 18: PCC 28 CM FLEXURAL STRENGTH OF PCC

TABLE 46-1 MODEL NO. 18: PCC 18 cm FLEXURAL STRENGTH OF PCC

8 - 11 (24)

COURSE
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Core Sample Test

Hast Thomas			Left	Left Lane	Right Lane	Lane
A		· Jado	0 + 210	0 + 380	0 + 210 0 + 380 0 + 210 0 + 390	0 + 330
Layer Thickness from Core Sample Core Density Laboratory Density Compaction Degree	cm &r/cm <sup>a</sup> &r/cm <sup>a</sup>	5.0	6.2 2.384 2.466 97.46	6.2 2.349 2.458 95.56	5.3 2.463 2.589 95.13	4.8 2.344 2.452 95.60

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TABLE 48 MODEL NO. 18: PCC 18 Cm SURFACE COURSE

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Core Sample Test	Left Lane

Right Lane	0 + 0 1 0 + 0 1 0 + 1 1 0 0 + 0 1 0 + 1 1 0 0 + 1 1 0 0 + 1 0 0 0 + 1 0 0 0 + 1 0 0 0 0	20.6 19.0
Lane	0 + 190 0	18.6
Left Lane	010 + 0	19.2
0000	o b b c	cm 18.0
		G
Tact Itame	SHDA 1 - 2001	Layer Thickness from Core Sample

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