

**Index of Provisionally Approved Mix Designs  
Asphalt Surfaces (International) Ltd.**

**I. Normal Mix**

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/HD/002	10WC/ASL/HD/002	12-Nov-2020	30-Jun-2021	29-Jun-2024
20mm Wearing Course	20WC/ASL/TS/003	20WC/ASL/TS/003	14-Dec-2022	09-Jan-2023	08-Jan-2026
28mm Base Course	28BC/ASL/TS/003	28BC/ASL/TS/003	08-Dec-2022	09-Jan-2023	08-Jan-2026
37.5mm Base Course	40BC/ASL/TS/003	40BC/ASL/TS/003	04-Aug-2022	09-Jan-2023	08-Jan-2026
37.5mm Roadbase (recipe mix)	40RB/ASL/TS/003	40RB/ASL/TS/003	15-Dec-2022	--	--

**II. Reclaimed Asphalt Pavement (RAP) Mix**

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/HD/RAP15/002	10WC/ASL/HD/RAP15/002	27-Apr-2021	28-Jun-2021	27-Jun-2024
20mm Wearing Course	20WC/ASL/HD/RAP15/002	20WC/ASL/HD/RAP15/002	29-Apr-2021	28-Jun-2021	27-Jun-2024
28mm Base Course	28BC/ASL/HD/RAP15/002	28BC/ASL/HD/RAP15/002	04-May-2021	28-Jun-2021	27-Jun-2024
37.5mm Base Course	40BC/ASL/HD/RAP15/002	40BC/ASL/HD/RAP15/002	06-May-2021	28-Jun-2021	27-Jun-2024

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/HD/RAP20/002	10WC/ASL/HD/RAP20/002	10-May-2021	30-Jun-2021	29-Jun-2024
20mm Wearing Course	20WC/ASL/TS/RAP20/003	20WC/ASL/TS/RAP20/003	02-Dec-2022	23-Dec-2022	22-Dec-2025
28mm Base Course	28BC/ASL/TS/RAP20/003	28BC/ASL/TS/RAP20/003	23-Nov-2022	23-Dec-2022	22-Dec-2025
37.5mm Base Course	40BC/ASL/TS/RAP20/003	40BC/ASL/TS/RAP20/003	14-Nov-2022	23-Dec-2022	22-Dec-2025
37.5mm Roadbase (recipe mix)	40RB/ASL/TS/RAP15/003	40RB/ASL/TS/RAP15/003	10-Dec-2022	--	--

**III. Reclaimed Asphalt Pavement (RAP) with Lime Mix**

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/HD/RAP15/LIME/002	10WC/ASL/HD/RAP15/LIME/002	24-May-2021	15-Jul-2021	14-Jul-2024
20mm Wearing Course	20WC/ASL/HD/RAP15/LIME/002	20WC/ASL/HD/RAP15/LIME/002	27-May-2021	15-Jul-2021	14-Jul-2024
28mm Base Course	28BC/ASL/HD/RAP15/LIME/002	28BC/ASL/HD/RAP15/LIME/002	03-Jun-2021	15-Jul-2021	14-Jul-2024
37.5mm Base Course	40BC/ASL/HD/RAP15/LIME/002	40BC/ASL/HD/RAP15/LIME/002	10-Jun-2021	15-Jul-2021	14-Jul-2024

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/TS/RAP20/LIME/003	10WC/ASL/TS/RAP20/LIME/003	03-Nov-2022	08-Dec-2022	07-Dec-2025
20mm Wearing Course	20WC/ASL/TS/RAP20/LIME/003	20WC/ASL/TS/RAP20/LIME/003	20-Oct-2022	08-Dec-2022	07-Dec-2025
28mm Base Course	28BC/ASL/TS/RAP20/LIME/003	40BC/ASL/TS/RAP20/LIME/003	13-Oct-2022	08-Dec-2022	07-Dec-2025
37.5mm Base Course	40BC/ASL/TS/RAP20/LIME/003	40BC/ASL/TS/RAP20/LIME/003	29-Sep-2022	08-Dec-2022	07-Dec-2025
37.5mm Roadbase (recipe mix)	40RB/ASL/TS/RAP15/LIME/003	40RB/ASL/TS/RAP15/LIME/003	10-Nov-2022	--	--

**IV. Lime Mix**

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Wearing Course	10WC/ASL/TS/LIME/003	10WC/ASL/TS/LIME/003	08-Sep-2022	23-Nov-2022	22-Nov-2025
20mm Wearing Course	20WC/ASL/TS/LIME/003	20WC/ASL/TS/LIME/003	29-Aug-2022	23-Nov-2022	22-Nov-2025
28mm Base Course	28BC/ASL/TS/LIME/003	28BC/ASL/TS/LIME/003	22-Sep-2022	23-Nov-2022	22-Nov-2025
37.5mm Base Course	40BC/ASL/TS/LIME/003	40BC/ASL/TS/LIME/003	10-Aug-2022	23-Nov-2022	22-Nov-2025
37.5mm Roadbase (recipe mix)	40RB/ASL/TS/LIME/003	40RB/ASL/TS/LIME/003	28-Sep-2022	--	--

**V. Polymer Modified Mix**

Bituminous Material	HyD Mix No.	Supplier's Mix No.	Date of Design	Approval Date	Expiry Date
10mm Polymer Modified Friction Course	10PMFC/ASL/HD/PG/002	10PMFC/ASL/HD/PG/002	02-Jan-2020	24-Dec-2020	23-Dec-2023
3.35mm Polymer Modified Cushion Course	CC/ASL/HD/PG/002	CC/ASL/HD/PG/002	30-Dec-2019	24-Dec-2020	23-Dec-2023
10mm Polymer Modified Stone Mastic Asphalt	10PMSMA/ASL/HD/PG/VIA/002	10PMSMA/ASL/HD/PG/VIA/002	23-Jun-2020	24-Dec-2020	23-Dec-2023
6mm Polymer Modified Stone Mastic Asphalt	6PMSMA/ASL/HD/PG/VIA/002	6PMSMA/ASL/HD/PG/VIA/002	17-Sep-2020	24-Dec-2020	23-Dec-2023

Remark: Mix design details are tabled in the appropriate spreadsheets.

**Summary of Provisionally Approved Mix Designs**  
**Asphalt Surfaces (International) Ltd.**  
**(Normal Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock filler

## 2. Mix Designs :

Bituminous Material	10mm Wearing Course	
HyD Mix No.	10WC/ASL/HD/002	
Supplier's Mix No.	10WC/ASL/HD/002	
Date of Design	12-Nov-2020	
Approval Date	30-Jun-2021	
Expiry Date	29-Jun-2024	
	Design Grading	GS Requirement*
Binder content ( % )	6.0	5.5 - 6.5
B.S. Sieve (mm)	% Passing	
50		
37.5		
28		
20		
14	100	100
10	97	93 - 100
5	65	58 - 72
2.36	48	41 - 55
1.18	38	31 - 45
0.600	27	22 - 32
0.300	18	13 - 23
0.150	10	7 - 13
0.075	6.4	4.4 - 8.4
		9.4 <sup>#</sup>
	Marshall Properties	
Air voids in mix, VIM (%)	3.0	3.0 - 5.0
Voids in mineral aggregate, VMA (%)	16.0	$\geq$ 16
Marshall stability (kN)	12.2	$\geq$ 10
Flow (mm)	3.1	$\leq$ 4.0

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

**Summary of Provisionally Approved Mix Designs**  
**Asphalt Surfaces (International) Ltd.**  
**(Normal Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Tai Sheng Quarry, China	Crushed rock filler

## 2. Mix Designs :

Bituminous Material	20mm Wearing Course		28mm Base Course		37.5mm Base Course		37.5mm Roadbase (recipe mix)	
HyD Mix No.	20WC/ASL/TS/003		28BC/ASL/TS/003		40BC/ASL/TS/003		40RB/ASL/TS/003	
Supplier's Mix No.	20WC/ASL/TS/003		28BC/ASL/TS/003		40BC/ASL/TS/003		40RB/ASL/TS/003	
Date of Design	14-Dec-2022		08-Dec-2022		04-Aug-2022		15-Dec-2022	
Approval Date	09-Jan-2023		09-Jan-2023		09-Jan-2023		--	
Expiry Date	08-Jan-2026		08-Jan-2026		08-Jan-2026		--	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Data	GS Requirement*
Binder content ( % )	5.0	4.5 - 5.5	4.5	4.0 - 5.0	4.0	3.5 - 4.5	3.4	3.0 - 4.0
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing	
50					100	100	100	100
37.5			100	100	100	96 - 100	100	90 - 100
28	100	100	97	93 - 100	93	86 - 100	92	70 - 94
20	99	95 - 100	93	86 - 100	83	76 - 90	82	62 - 84
14	87	80 - 94	75	68 - 82	65	58 - 72	--	--
10	83	76 - 90	68	61 - 75	58	51 - 65	62	49 - 67
5	65	58 - 72	48	41 - 55	43	36 - 50	42	37 - 55
2.36	49	42 - 56	36	29 - 43	32	25 - 39	31	27 - 43
1.18	35	28 - 42	26	19 - 33	23	16 - 30	--	--
0.600	24	19 - 29	18	13 - 23	16	11 - 21	16	13 - 28
0.300	16	11 - 21	12	7 - 17	11	6 - 16	11	7 - 21
0.150	10	7 - 13	8	5 - 11	7	4 - 10	--	--
0.075	6.6	4.6 - 8.6 9.6 <sup>#</sup>	5.3	3.3 - 7.3 8.3 <sup>#</sup>	4.9	2.9 - 6.9 7.9 <sup>#</sup>	5.1	2.0 - 8.0 8.0 <sup>@</sup>
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	3.7	3.0 - 5.0	4.6	3.0 - 5.0	4.3	3.0 - 5.0	--	--
Voids in mineral aggregate, VMA (%)	14.6	$\geq 14$	14.3	$\geq 13$	13.1	$\geq 12.5$	--	--
Marshall stability (kN)	15.6	$\geq 10$	16.3	$\geq 10$	15.0	$\geq 10$	--	--
Flow (mm)	3.0	$\leq 4.0$	3.0	$\leq 4.0$	1.5	$\leq 4.0$	--	--

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.<sup>@</sup> The percentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

**Summary of Provisionally Approved Mix Designs**  
**Asphalt Surfaces (International) Ltd.**  
**(RAP Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock filler

## 2. Mix Designs :

Bituminous Material	10mm Wearing Course		20mm Wearing Course		28mm Base Course		37.5mm Base Course	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*
HyD Mix No.	10WC/ASL/HD/RAP15/002		20WC/ASL/HD/RAP15/002		28BC/ASL/HD/RAP15/002		40BC/ASL/HD/RAP15/002	
Supplier's Mix No.	10WC/ASL/HD/RAP15/002		20WC/ASL/HD/RAP15/002		28BC/ASL/HD/RAP15/002		40BC/ASL/HD/RAP15/002	
Date of Design	27-Apr-2021		29-Apr-2021		04-May-2021		06-May-2021	
Approval Date	28-Jun-2021		28-Jun-2021		28-Jun-2021		28-Jun-2021	
Expiry Date	27-Jun-2024		27-Jun-2024		27-Jun-2024		27-Jun-2024	
Binder content ( % )	6.1	5.6 - 6.6	5.1	4.6 - 5.6	4.6	4.1 - 5.1	4.1	3.6 - 4.6
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing	
50							100	100
37.5					100	100	99	95 - 100
28			100	100	97	93 - 100	89	82 - 96
20			97	93 - 100	91	84 - 98	81	74 - 88
14	100	100	89	82 - 96	74	67 - 81	67	60 - 74
10	96	92 - 100	82	75 - 89	63	56 - 70	59	52 - 66
5	65	58 - 72	62	55 - 69	41	34 - 48	44	37 - 51
2.36	49	42 - 56	47	40 - 54	30	23 - 37	35	28 - 42
1.18	38	31 - 45	37	30 - 44	24	17 - 31	27	20 - 34
0.600	27	22 - 32	26	21 - 31	17	12 - 22	19	14 - 24
0.300	18	13 - 23	17	12 - 22	12	7 - 17	13	8 - 18
0.150	9	6 - 12	9	6 - 12	6	3 - 9	7	4 - 10
0.075	5.8	3.8 - 7.8	5.7	3.7 - 7.7	4.2	2.2 - 6.2	4.7	2.7 - 6.7
		8.8 <sup>#</sup>		8.7 <sup>#</sup>		7.2 <sup>#</sup>		7.7 <sup>#</sup>
	(including 15% RAP)		(including 15% RAP)		(including 15% RAP)		(including 15% RAP)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	3.2	3.0 - 5.0	4.0	3.0 - 5.0	4.7	3.0 - 5.0	4.7	3.0 - 5.0
Voids in mineral aggregate, VMA (%)	16.1	$\geq 16$	14.7	$\geq 14$	14.3	$\geq 13$	13.1	$\geq 12.5$
Marshall stability (kN)	13.6	$\geq 10$	16.4	$\geq 10$	14.5	$\geq 10$	16.6	$\geq 10$
Flow (mm)	2.8	$\leq 4.0$	2.7	$\leq 4.0$	3.0	$\leq 4.0$	2.8	$\leq 4.0$

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

**Summary of Provisionally Approved Mix Designs  
Asphalt Surfaces (International) Ltd.  
(RAP Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock filler

## 2. Mix Designs :

Bituminous Material	10mm Wearing Course	
HyD Mix No.	10WC/ASL/HD/RAP20/002	
Supplier's Mix No.	10WC/ASL/HD/RAP20/002	
Date of Design	10-May-2021	
Approval Date	30-Jun-2021	
Expiry Date	29-Jun-2024	
	Design Grading	GS Requirement*
Binder content ( % )	6.1	5.6 - 6.6
B.S. Sieve (mm)	% Passing	
50		
37.5		
28		
20		
14	100	100
10	97	93 - 100
5	68	61 - 75
2.36	51	44 - 58
1.18	40	33 - 47
0.600	29	24 - 34
0.300	19	14 - 24
0.150	10	7 - 13
0.075	6.6	4.6 - 8.6 9.6 <sup>#</sup>
	(including 20% RAP)	
	Marshall Properties	
Air voids in mix, VIM (%)	3.8	3.0 - 5.0
Voids in mineral aggregate, VMA (%)	16.5	$\geq$ 16
Marshall stability (kN)	13.4	$\geq$ 10
Flow (mm)	3.3	$\leq$ 4.0

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

**Summary of Provisionally Approved Mix Designs**  
**Asphalt Surfaces (International) Ltd.**  
**(RAP Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Tai Sheng Quarry, China	Crushed rock filler

## 2. Mix Designs :

Bituminous Material	20mm Wearing Course		28mm Base Course		37.5mm Base Course		37.5mm Roadbase (recipe mix)	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Data	GS Requirement*
HyD Mix No.	20WC/ASL/TS/RAP20/003		28BC/ASL/TS/RAP20/003		40BC/ASL/TS/RAP20/003		40RB/ASL/TS/RAP15/003	
Supplier's Mix No.	20WC/ASL/TS/RAP20/003		28BC/ASL/TS/RAP20/003		40BC/ASL/TS/RAP20/003		40RB/ASL/TS/RAP15/003	
Date of Design	02-Dec-2022		23-Nov-2022		14-Nov-2022		10-Dec-2022	
Approval Date	23-Dec-2022		23-Dec-2022		23-Dec-2022		--	
Expiry Date	22-Dec-2025		22-Dec-2025		22-Dec-2025		--	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Data	GS Requirement*
Binder content ( % )	5.0	4.5 - 5.5	4.5	4.0 - 5.0	4.0	3.5 - 4.5	3.5	3.0 - 4.0
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing	
50					100	100	100	100
37.5			100	100	100	96 - 100	100	90 - 100
28	100	100	97	93 - 100	93	86 - 100	92	70 - 94
20	99	95 - 100	93	86 - 100	83	76 - 90	81	62 - 84
14	87	80 - 94	75	68 - 82	65	58 - 72	--	--
10	83	76 - 90	68	61 - 75	58	51 - 65	62	49 - 67
5	65	58 - 72	48	41 - 55	43	36 - 50	46	37 - 55
2.36	49	42 - 56	36	29 - 43	33	26 - 40	35	27 - 43
1.18	35	28 - 42	26	19 - 33	23	16 - 30	--	--
0.600	24	19 - 29	18	13 - 23	16	11 - 21	17	13 - 28
0.300	16	11 - 21	12	7 - 17	11	6 - 16	11	7 - 21
0.150	10	7 - 13	8	5 - 11	7	4 - 10	--	--
0.075	6.8	4.8 - 8.8	5.4	3.4 - 7.4	5.0	3.0 - 7.0	5.2	2.0 - 8.0
		9.8 <sup>#</sup>		8.4 <sup>#</sup>		8.0 <sup>#</sup>		8.0 <sup>@</sup>
	(including 20% RAP)		(including 20% RAP)		(including 20% RAP)		(including 15% RAP)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	4.0	3.0 - 5.0	4.2	3.0 - 5.0	4.3	3.0 - 5.0	--	--
Voids in mineral aggregate, VMA (%)	14.9	≥ 14	14.0	≥ 13	13.0	≥ 12.5	--	--
Marshall stability (kN)	14.8	≥ 10	15.5	≥ 10	16.7	≥ 10	--	--
Flow (mm)	3.0	≤ 4.0	3.0	≤ 4.0	3.0	≤ 4.0	--	--

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.<sup>@</sup> The percentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

**Summary of Provisionally Approved Mix Designs  
Asphalt Surfaces (International) Ltd.  
(RAP with Lime Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Hui Dong Quarry, Guangdong, China Hydrated Lime - Great Wall Brand, China	Mixture of crushed rock filler and hydrated lime

## 2. Mix Designs :

Bituminous Material	10mm Wearing Course		20mm Wearing Course		28mm Base Course		37.5mm Base Course	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*
HyD Mix No.	10WC/ASL/HD/RAP15/LIME/002		20WC/ASL/HD/RAP15/LIME/002		28BC/ASL/HD/RAP15/LIME/002		40BC/ASL/HD/RAP15/LIME/002	
Supplier's Mix No.	10WC/ASL/HD/RAP15/LIME/002		20WC/ASL/HD/RAP15/LIME/002		28BC/ASL/HD/RAP15/LIME/002		40BC/ASL/HD/RAP15/LIME/002	
Date of Design	24-May-2021		27-May-2021		03-Jun-2021		10-Jun-2021	
Approval Date	15-Jul-2021		15-Jul-2021		15-Jul-2021		15-Jul-2021	
Expiry Date	14-Jul-2024		14-Jul-2024		14-Jul-2024		14-Jul-2024	
Binder content ( % )	6.1	5.6 - 6.6	5.1	4.6 - 5.6	4.6	4.1 - 5.1	4.1	3.6 - 4.6
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing	
50							100	100
37.5					100	100	99	95 - 100
28			100	100	97	93 - 100	89	82 - 96
20			97	93 - 100	91	84 - 98	81	74 - 88
14	100	100	89	82 - 96	74	67 - 81	67	60 - 74
10	96	92 - 100	82	75 - 89	63	56 - 70	59	52 - 66
5	64	57 - 71	62	55 - 69	41	34 - 48	44	37 - 51
2.36	48	41 - 55	47	40 - 54	31	24 - 38	34	27 - 41
1.18	38	31 - 45	37	30 - 44	24	17 - 31	27	20 - 34
0.600	27	22 - 32	27	22 - 32	18	13 - 23	20	15 - 25
0.300	18	13 - 23	18	13 - 23	12	7 - 17	13	8 - 18
0.150	10	7 - 13	10	7 - 13	7	4 - 10	7	4 - 10
0.075	6.6	4.6 - 8.6 9.6 <sup>#</sup>	6.6	4.6 - 8.6 9.6 <sup>#</sup>	4.8	2.8 - 6.8 7.8 <sup>#</sup>	5.2	3.2 - 7.2 8.2 <sup>#</sup>
	(including 15% RAP & 1.5% hydrated Lime)		(including 15% RAP & 1.5% hydrated Lime)		(including 15% RAP & 1.5% hydrated Lime)		(including 15% RAP & 1.5% hydrated Lime)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	3.2	3.0 - 5.0	3.5	3.0 - 5.0	4.5	3.0 - 5.0	4.4	3.0 - 5.0
Voids in mineral aggregate, VMA (%)	16.2	$\geq 16$	14.2	$\geq 14$	14.0	$\geq 13$	12.8	$\geq 12.5$
Marshall stability (kN)	13.2	$\geq 10$	15.2	$\geq 10$	14.5	$\geq 10$	18.2	$\geq 10$
Flow (mm)	3.5	$\leq 4.0$	2.9	$\leq 4.0$	3.0	$\leq 4.0$	3.0	$\leq 4.0$
Hydrated Lime (%)	1.5	$\geq 1.5$	1.5	$\geq 1.5$	1.5	$\geq 1.5$	1.5	$\geq 1.5$

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

**Summary of Provisionally Approved Mix Designs**  
**Asphalt Surfaces (International) Ltd.**  
**(RAP with Lime Mix)**

## 1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Filler (passing 75 $\mu$ m BS sieve)	Tai Sheng Quarry, China Hydrated Lime - Great Wall Brand, China	Mixture of crushed rock filler and hydrated lime

## 2. Mix Designs :

Bituminous Material	10mm Wearing Course		20mm Wearing Course		28mm Base Course		37.5mm Base Course		37.5mm Roadbase (recipe mix)	
	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Grading	GS Requirement*	Design Data	GS Requirement*
HyD Mix No.	10WC/ASL/TS/RAP20/LIME/003		20WC/ASL/TS/RAP20/LIME/003		28BC/ASL/TS/RAP20/LIME/003		40BC/ASL/TS/RAP20/LIME/003		40RB/ASL/TS/RAP15/LIME/003	
Supplier's Mix No.	10WC/ASL/TS/RAP20/LIME/003		20WC/ASL/TS/RAP20/LIME/003		28BC/ASL/TS/RAP20/LIME/003		40BC/ASL/TS/RAP20/LIME/003		40RB/ASL/TS/RAP15/LIME/003	
Date of Design	03-Nov-2022		20-Oct-2022		13-Oct-2022		29-Sep-2022		10-Nov-2022	
Approval Date	08-Dec-2022		08-Dec-2022		08-Dec-2022		08-Dec-2022		--	
Expiry Date	07-Dec-2025		07-Dec-2025		07-Dec-2025		07-Dec-2025		--	
Binder content ( % )	6.1	5.6 - 6.6	5.0	4.5 - 5.5	4.5	4.0 - 5.0	4.0	3.5 - 4.5	3.5	3.0 - 4.0
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing		% Passing	
50							100	100	100	100
37.5					100	100	100	96 - 100	100	90 - 100
28			100	100	97	93 - 100	93	86 - 100	92	70 - 94
20			99	95 - 100	93	86 - 100	83	76 - 90	81	62 - 84
14	100	100	87	80 - 94	75	68 - 82	65	58 - 72	--	--
10	99	95 - 100	83	76 - 90	68	61 - 75	58	51 - 65	62	49 - 67
5	70	63 - 77	65	58 - 72	48	41 - 55	43	36 - 50	46	37 - 55
2.36	52	45 - 59	49	42 - 56	36	29 - 43	33	26 - 40	35	27 - 43
1.18	37	30 - 44	35	28 - 42	26	19 - 33	23	16 - 30	--	--
0.600	25	20 - 30	24	19 - 29	18	13 - 23	16	11 - 21	17	13 - 28
0.300	17	12 - 22	16	11 - 21	12	7 - 17	11	6 - 16	11	7 - 21
0.150	11	8 - 14	10	7 - 13	8	5 - 11	7	4 - 10	--	--
0.075	7.4	5.4 - 9.4	7.0	5.0 - 9.0	5.7	3.7 - 7.7	5.3	3.3 - 7.3	5.5	2.0 - 8.0
		10.4 <sup>#</sup>		10.0 <sup>#</sup>		8.7 <sup>#</sup>		8.3 <sup>#</sup>		8.0 <sup>@</sup>
	(including 20% RAP & 1.5% hydrated Lime)		(including 20% RAP & 1.5% hydrated Lime)		(including 20% RAP & 1.5% hydrated Lime)		(including 20% RAP & 1.5% hydrated Lime)		(including 15% RAP & 1.5% hydrated Lime)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	3.8	3.0 - 5.0	4.1	3.0 - 5.0	4.3	3.0 - 5.0	4.2	3.0 - 5.0	--	--
Voids in mineral aggregate, VMA (%)	16.9	$\geq 16$	14.7	$\geq 14$	13.8	$\geq 13$	12.8	$\geq 12.5$	--	--
Marshall stability (kN)	12.4	$\geq 10$	15.2	$\geq 10$	13.9	$\geq 10$	15.4	$\geq 10$	--	--
Flow (mm)	3.7	$\leq 4.0$	2.8	$\leq 4.0$	2.9	$\leq 4.0$	2.9	$\leq 4.0$	--	--
Hydrated Lime (%)	1.5	$\geq 1.5$	1.5	$\geq 1.5$	1.5	$\geq 1.5$	1.5	$\geq 1.5$	1.5	$\geq 1.5$

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.<sup>@</sup> The percentage passing the 0.075mm BS test sieve shall not exceed 8.0%.



**Summary of Provisionally Approved Mix Designs  
Asphalt Surfaces (International) Ltd.  
(Lime Mix)**

1. Source and Type of Constituent Materials :

Constituent Material	Source	Type
Bitumen	Shell (Hong Kong) Limited	Grade Pen 60/70 FreshAir
Coarse Aggregate (retained on 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Fine Aggregate (passing 5mm BS sieve)	Tai Sheng Quarry, China	Crushed rock (Granite)
Filler (passing 75 μm BS sieve)	Tai Sheng Quarry, China Hydrated Lime - Great Wall Brand, China	Mixture of crushed rock filler and hydrated lime

2. Mix Designs :

Bituminous Material	10mm Wearing Course		20mm Wearing Course		28mm Base Course		37.5mm Base Course		37.5mm Roadbase (recipe mix)	
	Design Grading	PS Requirement*	Design Grading	PS Requirement*	Design Grading	PS Requirement*	Design Grading	PS Requirement*	Design Data	PS Requirement*
HyD Mix No.	10WC/ASL/TS/LIME/003		20WC/ASL/TS/LIME/003		28BC/ASL/TS/LIME/003		40BC/ASL/TS/LIME/003		40RB/ASL/TS/LIME/003	
Supplier's Mix No.	10WC/ASL/TS/LIME/003		20WC/ASL/TS/LIME/003		28BC/ASL/TS/LIME/003		40BC/ASL/TS/LIME/003		40RB/ASL/TS/LIME/003	
Date of Design	08-Sep-2022		29-Aug-2022		22-Sep-2022		10-Aug-2022		28-Sep-2022	
Approval Date	23-Nov-2022		23-Nov-2022		23-Nov-2022		23-Nov-2022		--	
Expiry Date	22-Nov-2025		22-Nov-2025		22-Nov-2025		22-Nov-2025		--	
Binder content ( % )	6.0	5.5 - 6.5	5.0	4.5 - 5.5	4.5	4.0 - 5.0	4.0	3.5 - 4.5	3.5	3.0 - 4.0
B.S. Sieve (mm)	% Passing		% Passing		% Passing		% Passing		% Passing	
50							100	100	100	100
37.5					100	100	100	96 - 100	100	90 - 100
28			100	100	97	93 - 100	93	86 - 100	92	70 - 94
20			99	95 - 100	93	86 - 100	83	76 - 90	81	62 - 84
14	100	100	87	80 - 94	75	68 - 82	65	58 - 72	--	--
10	99	95 - 100	83	76 - 90	68	61 - 75	58	51 - 65	62	49 - 67
5	70	63 - 77	65	58 - 72	48	41 - 55	43	36 - 50	42	37 - 55
2.36	52	45 - 59	49	42 - 56	36	29 - 43	32	25 - 39	31	27 - 43
1.18	37	30 - 44	35	28 - 42	26	19 - 33	23	16 - 30	--	--
0.600	25	20 - 30	24	19 - 29	18	13 - 23	16	11 - 21	16	13 - 28
0.300	17	12 - 22	16	11 - 21	12	7 - 17	11	6 - 16	11	7 - 21
0.150	11	8 - 14	10	7 - 13	8	5 - 11	7	4 - 10	--	--
0.075	7.2	5.2 - 9.2	6.9	4.9 - 8.9	5.5	3.5 - 7.5	5.1	3.1 - 7.1	5.4	2.0 - 8.0
		10.2 <sup>#</sup>		9.9 <sup>#</sup>		8.5 <sup>#</sup>		8.1 <sup>#</sup>		8.0 <sup>@</sup>
	(including 1.5% hydrated lime)		(including 1.5% hydrated lime)		(including 1.5% hydrated lime)		(including 1.5% hydrated lime)		(including 1.5% hydrated lime)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	3.8	3.0 - 5.0	3.5	3.0 - 5.0	4.4	3.0 - 5.0	4.2	3.0 - 5.0	--	--
Voids in mineral aggregate, VMA (%)	16.6	≥ 16	14.3	≥ 14	14.1	≥ 13	12.9	≥ 12.5	--	--
Marshall stability (kN)	11.2	≥ 10	13.0	≥ 10	13.9	≥ 10	15.9	≥ 10	--	--
Flow (mm)	2.8	≤ 4.0	2.7	≤ 4.0	2.8	≤ 4.0	2.8	≤ 4.0	--	--
Hydrated lime ( % )	1.5	≥ 1.5	1.5	≥ 1.5	1.5	≥ 1.5	1.5	≥ 1.5	1.5	≥ 1.5

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

<sup>@</sup> The percentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

**Summary of Provisionally Approved Mix Designs  
Asphalt Surfaces (International) Ltd.  
(Polymer Modified Mix)**

1. Source and Type of Constituent Materials :

Constituent Material	Source	Type			
		10PMFC/ASL/HD/PG/002	CC/ASL/HD/PG/002	10PMSMA/ASL/HD/PG/VIA/002	6PMSMA/ASL/HD/PG/VIA/002
Bitumen	Shell (Hong Kong) Limited	Cariphalte PG76			
Coarse Aggregate (retained on 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)	Not applicable	Crushed rock (Granite)	
	Kai Ping Shi Jin Xing Kuang Ye Co., Ltd., Guangdong, China	Not applicable		Not applicable	Crushed rock (Metasiltstone)
Fine Aggregate (passing 5mm BS sieve)	Hui Dong Quarry, Guangdong, China	Crushed rock (Granite)		Crushed rock (Granite)	
	Kai Ping Shi Jin Xing Kuang Ye Co., Ltd., Guangdong, China	Not applicable		Not applicable	Crushed rock (Metasiltstone)
Filler (passing 75 μm BS sieve)	Hui Dong Quarry, Guangdong, China	Mixture of crushed rock filler and hydrated lime			
Fibre	J. Rettenmaier & Sohne (Germany)	Not applicable		Cellulose Fibre (Viatop premium)	

2. Mix Designs :

Bituminous Material	10mm Polymer Modified Friction Course		3.35mm Polymer Modified Cushion Course		10mm Polymer Modified Stone Mastic Asphalt		6mm Polymer Modified Stone Mastic Asphalt	
HyD Mix No.	10PMFC/ASL/HD/PG/002		CC/ASL/HD/PG/002		10PMSMA/ASL/HD/PG/VIA/002		6PMSMA/ASL/HD/PG/VIA/002	
Supplier's Mix No.	10PMFC/ASL/HD/PG/002		CC/ASL/HD/PG/002		10PMSMA/ASL/HD/PG/VIA/002		6PMSMA/ASL/HD/PG/VIA/002	
Date of Design	02-Jan-2020		30-Dec-2019		23-Jun-2020		17-Sep-2020	
Approval Date	24-Dec-2020		24-Dec-2020		24-Dec-2020		24-Dec-2020	
Expiry Date	23-Dec-2023		23-Dec-2023		23-Dec-2023		23-Dec-2023	
	Design Grading	PS Requirement*	Design Grading	PS Requirement*	Design Grading	PS Requirement*	Design Grading	PS Requirement*
Polymer modified binder content (%)	5.5	5.0 - 6.0	9.6	9.1 - 10.1	6.1	5.4 - 6.4	6.5	5.8 - 6.8
B.S. Sieve (mm)	% passing		% passing		% Passing		% Passing	
14	100	100			100	100	100	100
10	92	88 - 96			94	90 - 98	99	95 - 100
6.3	--	--	100	100	--	--	--	--
5	22	15 - 29	--	--	36	29 - 43	77	70 - 84
3.35	--	--	95	91 - 99	--	--	--	--
2.36	12	5 - 19	--	--	27	20 - 34	22	15 - 29
1.18	--	--	61	54 - 68	--	--	16	9 - 23
0.300	--	--	30	25 - 35	--	--	--	--
0.075	3.9	1.9 - 5.9 6.9 <sup>#</sup>	13.5	11.5 - 15.5 16.5 <sup>#</sup>	9.0	7.0 - 11.0 12.0 <sup>#</sup>	9.4	7.4 - 11.4 12.4 <sup>#</sup>
	(including 2% hydrated lime)		(including 2.1% hydrated lime)		(including 2.1% hydrated lime)		(including 2.1% hydrated lime)	
	Marshall Properties		Marshall Properties		Marshall Properties		Marshall Properties	
Air voids in mix, VIM (%)	20.6	≥ 20	--	--	4.2	3.5 - 4.5	9.9	7.0 - 10.0
Voids in mineral aggregate, VMA (%)	--	--	--	--	17.5	≥ 17	22.7	≥ 17
Marshall stability (kN)	--	--	--	--	13.0	≥ 6	10.4	≥ 6
Binder draindown ( % )	--	--	--	--	0.05	≤ 0.3	0.08	≤ 0.3
Marshall quotient (kN/mm)	--	--	0.9	0.7 - 1.2	--	--	--	--
Binder drainage test	Pass	Tmax > Binder content	--	--	--	--	--	--

\* For reference only

<sup>#</sup> The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.