Updated as at 01 September 2025

**Index of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**

**I. Normal Mix**

| Bituminous Material | HyD Mix No. | Supplier's Mix No. | Date of Design | Approval Date | Expiry Date |
|---|---|---|---|---|---|
| 10mm Wearing Course | 10WC/KWA/GH/001 | 10WC/KWA/GH/001 | 23-Nov-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 20mm Wearing Course | 20WC/KWA/GH/001 | 20WC/KWA/GH/001 | 29-Nov-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 28mm Base Course | 28BC/KWA/GH/001 | 28BC/KWA/GH/001 | 05-Dec-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Base Course | 40BC/KWA/GH/001 | 40BC/KWA/GH/001 | 12-Dec-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Roadbase (recipe mix) | 40RB/KWA/GH/001 | 40RB/KWA/GH/001 | 02-Nov-2023 | 15-Jan-2024 | -- |

**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/KWA/GH/RAP15/001 | 10WC/KWA/GH/RAP15/001 | 01-Aug-2023 | 12-Jan-2024 | 11-Jan-2027 |
| 20mm Wearing Course | 20WC/KWA/GH/RAP15/001 | 20WC/KWA/GH/RAP15/001 | 26-Jun-2023 | 12-Jan-2024 | 11-Jan-2027 |
| 28mm Base Course | 28BC/KWA/GH/RAP15/001 | 28BC/KWA/GH/RAP15/001 | 08-Jun-2023 | 12-Jan-2024 | 11-Jan-2027 |
| 37.5mm Base Course | 40BC/KWA/GH/RAP15/001 | 40BC/KWA/GH/RAP15/001 | 24-May-2023 | 12-Jan-2024 | 11-Jan-2027 |

| Bituminous Material | HyD Mix No. | Supplier's Mix No. | Date of Design | Approval Date | Expiry Date |
|---|---|---|---|---|---|
| 10mm Wearing Course | 10WC/KWA/GH/RAP20/001 | 10WC/KWA/GH/RAP20/001 | 27-Feb-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 20mm Wearing Course | 20WC/KWA/GH/RAP20/001 | 20WC/KWA/GH/RAP20/001 | 24-Apr-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 28mm Base Course | 28BC/KWA/GH/RAP20/001 | 28BC/KWA/GH/RAP20/001 | 14-Apr-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Base Course | 40BC/KWA/GH/RAP20/001 | 40BC/KWA/GH/RAP20/001 | 16-Mar-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Roadbase (recipe mix) | 40RB/KWA/GH/RAP15/001 | 40RB/KWA/GH/RAP15/001 | 02-Nov-2023 | 17-Jan-2024 | -- |

**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/KWA/GH/RAP15/LIME/001 | 10WC/KWA/GH/RAP15/LIME/001 | 25-Oct-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 20mm Wearing Course | 20WC/KWA/GH/RAP15/LIME/001 | 20WC/KWA/GH/RAP15/LIME/001 | 22-Aug-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 28mm Base Course | 28BC/KWA/GH/RAP15/LIME/001 | 28BC/KWA/GH/RAP15/LIME/001 | 05-Sep-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Base Course | 40BC/KWA/GH/RAP15/LIME/001 | 40BC/KWA/GH/RAP15/LIME/001 | 11-Sep-2023 | 15-Jan-2024 | 14-Jan-2027 |

| Bituminous Material | HyD Mix No. | Supplier's Mix No. | Date of Design | Approval Date | Expiry Date |
|---|---|---|---|---|---|
| 10mm Wearing Course | 10WC/KWA/GH/RAP20/LIME/001 | 10WC/KWA/GH/RAP20/LIME/001 | 18-Oct-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 20mm Wearing Course | 20WC/KWA/GH/RAP20/LIME/001 | 20WC/KWA/GH/RAP20/LIME/001 | 13-Oct-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 28mm Base Course | 28BC/KWA/GH/RAP20/LIME/001 | 28BC/KWA/GH/RAP20/LIME/001 | 10-Oct-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Base Course | 40BC/KWA/GH/RAP20/LIME/001 | 40BC/KWA/GH/RAP20/LIME/001 | 21-Sep-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 37.5mm Roadbase (recipe mix) | 40RB/KWA/GH/RAP15/LIME/001 | 40RB/KWA/GH/RAP15/LIME/001 | 02-Nov-2023 | 15-Jan-2024 | -- |

**IV. Rubberized Mix**

| Bituminous Material | HyD Mix No. | Supplier's Mix No. | Date of Design | Approval Date | Expiry Date |
|---|---|---|---|---|---|
| 10mm Wearing Course | 10RWC/KWA/GH/RAP20/TB10/001 | 10RWC/KWA/GH/RAP20/TB10/001 | 19-Dec-2023 | 01-Mar-2024 | 28-Feb-2027 |
| 20mm Wearing Course | 20RWC/KWA/GH/RAP20/TB10/001 | 20RWC/KWA/GH/RAP20/TB10/001 | 02-Jan-2024 | 01-Mar-2024 | 28-Feb-2027 |
| 28mm Base Course | 28RBC/KWA/GH/RAP20/TB10/001 | 28RBC/KWA/GH/RAP20/TB10/001 | 29-Jan-2024 | 01-Mar-2024 | 28-Feb-2027 |
| 37.5mm Base Course | 40RBC/KWA/GH/RAP20/TB10/001 | 40RBC/KWA/GH/RAP20/TB10/001 | 15-Jan-2024 | 01-Mar-2024 | 28-Feb-2027 |
| 37.5mm Roadbase (recipe mix) | 40RRB/KWA/GH/RAP15/TB10/001 | 40RRB/KWA/GH/RAP15/TB10/001 | 26-May-2025 | 27-Jun-2025 | -- |

**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/KWA/GH/PG/001 | 10PMFC/KWA/GH/PG/001 | 28-Oct-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 3.35mm Polymer Modified Cushion Course | CC/KWA/GH/PG/001 | CC/KWA/GH/PG/001 | 09-Nov-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 10mm Polymer Modified Stone Mastic Asphalt | 10PMSMA/KWA/GH/PG/ITF/75/001 | 10PMSMA/KWA/GH/PG/ITF/75/001 | 01-Nov-2023 | 15-Jan-2024 | 14-Jan-2027 |
| 6mm Polymer Modified Stone Mastic Asphalt | 6PMSMA/KWA/GH&BQ/PG/ITF/75/001 | 6PMSMA/KWA/GH&BQ/PG/ITF/75/001 | 06-Nov-2023 | 15-Jan-2024 | 14-Jan-2027 |

**VI. Highly Modified Mix**

| Bituminous Material | HyD Mix No. | Supplier's Mix No. | Date of Design | Approval Date | Expiry Date |
|---|---|---|---|---|---|
| 10mm Highly Modified Friction Course | 10HMFC/KWA/GH/001 | 10HMFC/KWA/GH/001 | 14-Nov-2023 | 12-Jan-2024 | 11-Jan-2027 |
| 3.35mm Highly Modified Cushion Course | HMCC/KWA/GH/001 | HMCC/KWA/GH/001 | 18-Dec-2024 | 23-Jan-2025 | 22-Jan-2028 |
| 10mm Highly Modified Stone Mastic Asphalt | 10HMSMA/KWA/GH/ITF/75/001 | 10HMSMA/KWA/GH/ITF/75/001 | 16-Nov-2023 | 12-Jan-2024 | 11-Jan-2027 |
| 6mm Highly Modified Stone Mastic Asphalt | 6HMSMA/KWA/GH&BQ/ITF/75/001 | 6HMSMA/KWA/GH&BQ/ITF/75/001 | 18-Nov-2023 | 12-Jan-2024 | 11-Jan-2027 |

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

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(Normal Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$ m BS sieve) | Guan Hong Quarry, China | Crushed rock filler |

2. Mix Designs :

| **Bituminous Material** | **10mm Wearing Course** | | **20mm Wearing Course** | | **28mm Base Course** | | **37.5mm Base Course** | | **37.5mm Roadbase (recipe mix)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10WC/KWA/GH/001 | | 20WC/KWA/GH/001 | | 28BC/KWA/GH/001 | | 40BC/KWA/GH/001 | | 40RB/KWA/GH/001 | |
| Supplier's Mix No. | 10WC/KWA/GH/001 | | 20WC/KWA/GH/001 | | 28BC/KWA/GH/001 | | 40BC/KWA/GH/001 | | 40RB/KWA/GH/001 | |
| Date of Design | 23-Nov-2023 | | 29-Nov-2023 | | 05-Dec-2023 | | 12-Dec-2023 | | 02-Nov-2023 | |
| Approval Date | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | |
| Expiry Date | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | -- | |
| | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Data | GS Requirement* |
| Binder content ( % ) | 6.0 | 5.5 - 6.5 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.1 | 3.6 - 4.6 | 3.5 | 3.0 - 4.0 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 | 97 | 90 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 | 89 | 70 - 94 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 | 78 | 62 - 84 |
| 14 | 100 | 100 | 87 | 80 - 94 | 75 | 68 - 82 | 72 | 65 - 79 | -- | -- |
| 10 | 95 | 91 - 99 | 79 | 72 - 86 | 62 | 55 - 69 | 62 | 55 - 69 | 58 | 49 - 67 |
| 5 | 75 | 68 - 82 | 68 | 61 - 75 | 52 | 45 - 59 | 54 | 47 - 61 | 50 | 37 - 55 |
| 2.36 | 52 | 45 - 59 | 48 | 41 - 55 | 37 | 30 - 44 | 39 | 32 - 46 | 37 | 27 - 43 |
| 1.18 | 37 | 30 - 44 | 36 | 29 - 43 | 28 | 21 - 35 | 30 | 23 - 37 | -- | -- |
| 0.60 | 27 | 22 - 32 | 25 | 20 - 30 | 21 | 16 - 26 | 22 | 17 - 27 | 22 | 13 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 15 | 10 - 20 | 14 | 7 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 | -- | -- |
| 0.075 | 6.4 | 4.4 - 8.4<br>9.4[#] | 6.9 | 4.9 - 8.9<br>9.9[#] | 5.3 | 3.3 - 7.3<br>8.3[#] | 6.2 | 4.2 - 8.2<br>9.2[#] | 5.3 | 2.0 - 8.0<br>8.0[@] |
| | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | |
| Air voids in mix, VIM (%) | 4.5 | 3.0 - 5.0 | 4.0 | 3.0 - 5.0 | 4.5 | 3.0 - 5.0 | 4.8 | 3.0 - 5.0 | -- | -- |
| Voids in mineral aggregate, VMA (%) | 17.5 | ≧16 | 15.1 | ≧14 | 14.5 | ≧13 | 13.8 | ≧12.5 | -- | -- |
| Marshall stability (kN) | 12.5 | ≧10 | 13.8 | ≧10 | 13.9 | ≧10 | 13.9 | ≧10 | -- | -- |
| Flow (mm) | 4.0 | ≦4.0 | 3.7 | ≦4.0 | 3.9 | ≦4.0 | 3.6 | ≦4.0 | -- | -- |

* For reference only

[#] The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

[@] The precentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(RAP Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$ m BS sieve) | Guan Hong Quarry, China | Crushed rock filler |

2. Mix Designs :

| **Bituminous Material** | **10mm Wearing Course** | | **20mm Wearing Course** | | **28mm Base Course** | | **37.5mm Base Course** | |
|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10WC/KWA/GH/RAP15/001 | | 20WC/KWA/GH/RAP15/001 | | 28BC/KWA/GH/RAP15/001 | | 40BC/KWA/GH/RAP15/001 | |
| Supplier's Mix No. | 10WC/KWA/GH/RAP15/001 | | 20WC/KWA/GH/RAP15/001 | | 28BC/KWA/GH/RAP15/001 | | 40BC/KWA/GH/RAP15/001 | |
| Date of Design | 01-Aug-2023 | | 26-Jun-2023 | | 08-Jun-2023 | | 24-May-2023 | |
| Approval Date | 12-Jan-2024 | | 12-Jan-2024 | | 12-Jan-2024 | | 12-Jan-2024 | |
| Expiry Date | 11-Jan-2027 | | 11-Jan-2027 | | 11-Jan-2027 | | 11-Jan-2027 | |
| | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* |
| Binder content ( % ) | 6.1 | 5.6 - 6.6 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.2 | 3.7 - 4.7 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 |
| 14 | 100 | 100 | 87 | 80 - 94 | 76 | 69 - 83 | 73 | 66 - 80 |
| 10 | 96 | 92 - 100 | 81 | 74 - 88 | 65 | 58 - 72 | 65 | 58 - 72 |
| 5 | 74 | 67 - 81 | 66 | 59 - 73 | 51 | 44 - 58 | 53 | 46 - 60 |
| 2.36 | 53 | 46 - 60 | 48 | 41 - 55 | 38 | 31 - 45 | 41 | 34 - 48 |
| 1.18 | 38 | 31 - 45 | 36 | 29 - 43 | 29 | 22 - 36 | 31 | 24 - 38 |
| 0.60 | 28 | 23 - 33 | 25 | 20 - 30 | 21 | 16 - 26 | 23 | 18 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 16 | 11 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 |
| 0.075 | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.9 | 4.9 - 8.9<br>9.9[#] | 5.3 | 3.3 - 7.3<br>8.3[#] | 6.2 | 4.2 - 8.2<br>9.2[#] |
| | (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 (%) | 4.0 | 3.0 - 5.0 | 4.7 | 3.0 - 5.0 | 4.2 | 3.0 - 5.0 | 4.3 | 3.0 - 5.0 |
| Voids in mineral aggregate, VMA (%) | 17.4 | ≧16 | 15.7 | ≧14 | 14.4 | ≧13 | 13.7 | ≧12.5 |
| Marshall stability (kN) | 10.1 | ≧10 | 14.5 | ≧10 | 15.4 | ≧10 | 17.0 | ≧10 |
| Flow (mm) | 3.3 | ≦4.0 | 3.0 | ≦4.0 | 3.8 | ≦4.0 | 3.4 | ≦4.0 |

* For reference only

[#] The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(RAP Mix)**

1. Source and Type of Constituent Materials :

| Constituent Material | Source | Type |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China | Crushed rock filler |

2. Mix Designs :

| Bituminous Material | 10mm Wearing Course | | 20mm Wearing Course | | 28mm Base Course | | 37.5mm Base Course | | 37.5mm Roadbase (recipe mix) | |
|---|---|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10WC/KWA/GH/RAP20/001 | | 20WC/KWA/GH/RAP20/001 | | 28BC/KWA/GH/RAP20/001 | | 40BC/KWA/GH/RAP20/001 | | 40RB/KWA/GH/RAP15/001 | |
| Supplier's Mix No. | 10WC/KWA/GH/RAP20/001 | | 20WC/KWA/GH/RAP20/001 | | 28BC/KWA/GH/RAP20/001 | | 40BC/KWA/GH/RAP20/001 | | 40RB/KWA/GH/RAP15/001 | |
| Date of Design | 27-Feb-2023 | | 24-Apr-2023 | | 14-Apr-2023 | | 16-Mar-2023 | | 02-Nov-2023 | |
| Approval Date | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 17-Jan-2024 | |
| Expiry Date | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | -- | |
| | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Data | GS Requirement* |
| Binder content ( % ) | 6.0 | 5.5 - 6.5 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.2 | 3.7 - 4.7 | 3.5 | 3.0 - 4.0 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 | 97 | 90 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 | 89 | 70 - 94 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 | 78 | 62 - 84 |
| 14 | 100 | 100 | 87 | 80 - 94 | 76 | 69 - 83 | 73 | 66 - 80 | -- | -- |
| 10 | 96 | 92 - 100 | 81 | 74 - 88 | 65 | 58 - 72 | 66 | 59 - 73 | 58 | 49 - 67 |
| 5 | 74 | 67 - 81 | 66 | 59 - 73 | 50 | 43 - 57 | 53 | 46 - 60 | 44 | 37 - 55 |
| 2.36 | 53 | 46 - 60 | 48 | 41 - 55 | 38 | 31 - 45 | 41 | 34 - 48 | 32 | 27 - 43 |
| 1.18 | 38 | 31 - 45 | 36 | 29 - 43 | 29 | 22 - 36 | 31 | 24 - 38 | -- | -- |
| 0.60 | 28 | 23 - 33 | 25 | 20 - 30 | 21 | 16 - 26 | 23 | 18 - 28 | 20 | 13 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 16 | 11 - 21 | 14 | 7 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 | -- | -- |
| 0.075 | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.9 | 4.9 - 8.9<br>9.9[#] | 5.4 | 3.4 - 7.4<br>8.4[#] | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.1 | 2.0 - 8.0<br>8.0[@] |
| | (including 20% RAP) | | (including 20% RAP) | | (including 20% RAP) | | (including 20% RAP) | | (including 15% RAP) | |
| | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | |
| Air voids in mix, VIM (%) | 3.7 | 3.0 - 5.0 | 4.8 | 3.0 - 5.0 | 4.5 | 3.0 - 5.0 | 4.8 | 3.0 - 5.0 | -- | -- |
| Voids in mineral aggregate, VMA (%) | 17.0 | ≧16 | 15.8 | ≧14 | 14.5 | ≧13 | 14.2 | ≧12.5 | -- | -- |
| Marshall stability (kN) | 13.4 | ≧10 | 15.1 | ≧10 | 15.6 | ≧10 | 17.3 | ≧10 | -- | -- |
| Flow (mm) | 3.5 | ≦4.0 | 3.3 | ≦4.0 | 3.8 | ≦4.0 | 3.6 | ≦4.0 | -- | -- |

* For reference only

[#] The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

[@] The precentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(RAP with Lime Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China<br>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** | |
|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10WC/KWA/GH/RAP15/LIME/001 | | 20WC/KWA/GH/RAP15/LIME/001 | | 28BC/KWA/GH/RAP15/LIME/001 | | 40BC/KWA/GH/RAP15/LIME/001 | |
| Supplier's Mix No. | 10WC/KWA/GH/RAP15/LIME/001 | | 20WC/KWA/GH/RAP15/LIME/001 | | 28BC/KWA/GH/RAP15/LIME/001 | | 40BC/KWA/GH/RAP15/LIME/001 | |
| Date of Design | 25-Oct-2023 | | 22-Aug-2023 | | 05-Sep-2023 | | 11-Sep-2023 | |
| Approval Date | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | |
| Expiry Date | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | |
| | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* |
| Binder content ( % ) | 6.0 | 5.5 - 6.5 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.1 | 3.6 - 4.6 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 |
| 14 | 100 | 100 | 87 | 80 - 94 | 76 | 69 - 83 | 73 | 66 - 80 |
| 10 | 96 | 92 - 100 | 81 | 74 - 88 | 65 | 58 - 72 | 65 | 58 - 72 |
| 5 | 74 | 67 - 81 | 66 | 59 - 73 | 51 | 44 - 58 | 53 | 46 - 60 |
| 2.36 | 53 | 46 - 60 | 48 | 41 - 55 | 38 | 31 - 45 | 41 | 34 - 48 |
| 1.18 | 38 | 31 - 45 | 36 | 29 - 43 | 29 | 22 - 36 | 31 | 24 - 38 |
| 0.60 | 28 | 23 - 33 | 25 | 20 - 30 | 21 | 16 - 26 | 23 | 18 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 16 | 11 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 |
| 0.075 | 6.3 | 4.3 - 8.3<br>9.3# | 6.9 | 4.9 - 8.9<br>9.9# | 5.3 | 3.3 - 7.3<br>8.3# | 6.2 | 4.2 - 8.2<br>9.2# |
| | (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 (%) | 3.7 | 3.0 - 5.0 | 4.6 | 3.0 - 5.0 | 4.3 | 3.0 - 5.0 | 4.8 | 3.0 - 5.0 |
| Voids in mineral aggregate, VMA (%) | 16.7 | ≧16 | 15.6 | ≧14 | 14.3 | ≧13 | 13.8 | ≧12.5 |
| Marshall stability (kN) | 12.7 | ≧10 | 10.0 | ≧10 | 12.1 | ≧10 | 10.8 | ≧10 |
| Flow (mm) | 4.0 | ≦4.0 | 3.3 | ≦4.0 | 3.8 | ≦4.0 | 3.6 | ≦4.0 |
| Hydrated Lime (%) | 1.5 | ≧1.5 | 1.5 | ≧1.5 | 1.5 | ≧1.5 | 1.5 | ≧1.5 |

* For reference only

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

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(RAP with Lime Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China<br>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)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10WC/KWA/GH/RAP20/LIME/001 | | 20WC/KWA/GH/RAP20/LIME/001 | | 28BC/KWA/GH/RAP20/LIME/001 | | 40BC/KWA/GH/RAP20/LIME/001 | | 40RB/KWA/GH/RAP15/LIME/001 | |
| Supplier's Mix No. | 10WC/KWA/GH/RAP20/LIME/001 | | 20WC/KWA/GH/RAP20/LIME/001 | | 28BC/KWA/GH/RAP20/LIME/001 | | 40BC/KWA/GH/RAP20/LIME/001 | | 40RB/KWA/GH/RAP15/LIME/001 | |
| Date of Design | 18-Oct-2023 | | 13-Oct-2023 | | 10-Oct-2023 | | 21-Sep-2023 | | 02-Nov-2023 | |
| Approval Date | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | |
| Expiry Date | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | -- | |
| | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Grading | GS Requirement* | Design Data | GS Requirement* |
| Binder content ( % ) | 6.0 | 5.5 - 6.5 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.2 | 3.7 - 4.7 | 3.5 | 3.0 - 4.0 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 | 97 | 90 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 | 89 | 70 - 94 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 | 78 | 62 - 84 |
| 14 | 100 | 100 | 87 | 80 - 94 | 76 | 69 - 83 | 73 | 66 - 80 | -- | -- |
| 10 | 96 | 92 - 100 | 81 | 74 - 88 | 65 | 58 - 72 | 66 | 59 - 73 | 58 | 49 - 67 |
| 5 | 74 | 67 - 81 | 66 | 59 - 73 | 50 | 43 - 57 | 53 | 46 - 60 | 44 | 37 - 55 |
| 2.36 | 53 | 46 - 60 | 48 | 41 - 55 | 38 | 31 - 45 | 41 | 34 - 48 | 32 | 27 - 43 |
| 1.18 | 38 | 31 - 45 | 36 | 29 - 43 | 29 | 22 - 36 | 31 | 24 - 38 | -- | -- |
| 0.60 | 28 | 23 - 33 | 25 | 20 - 30 | 21 | 16 - 26 | 23 | 18 - 28 | 20 | 13 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 16 | 11 - 21 | 14 | 7 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 | -- | -- |
| 0.075 | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.9 | 4.9 - 8.9<br>9.9[#] | 5.4 | 3.4 - 7.4<br>8.4[#] | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.1 | 2.0 - 8.0<br>8.0[@] |
| | (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 (%) | 4.0 | 3.0 - 5.0 | 3.7 | 3.0 - 5.0 | 4.7 | 3.0 - 5.0 | 4.6 | 3.0 - 5.0 | -- | -- |
| Voids in mineral aggregate, VMA (%) | 17.0 | ≧16 | 14.7 | ≧14 | 14.5 | ≧13 | 13.8 | ≧12.5 | -- | -- |
| Marshall stability (kN) | 12.6 | ≧10 | 14.3 | ≧10 | 10.6 | ≧10 | 12.2 | ≧10 | -- | -- |
| Flow (mm) | 3.4 | ≦4.0 | 3.4 | ≦4.0 | 3.3 | ≦4.0 | 3.6 | ≦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

[#] The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

[@] The precentage passing the 0.075mm BS test sieve shall not exceed 8.0%.

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(Rubberized Mix)**

1. Source and Type of Constituent Materials :

| Constituent Material | Source | Type |
|---|---|---|
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade 60/70 pen |
| Ground recycled tire rubber | On Fat Lung Innovative Resource Ltd. | --- |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China | Crushed rock filler |

2. Mix Designs :

| Bituminous Material | 10mm Wearing Course | | 20mm Wearing Course | | 28mm Base Course | | 37.5mm Base Course | | 37.5mm Roadbase (recipe mix) | |
|---|---|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10RWC/KWA/GH/RAP20/TB10/001 | | 20RWC/KWA/GH/RAP20/TB10/001 | | 28RBC/KWA/GH/RAP20/TB10/001 | | 40RBC/KWA/GH/RAP20/TB10/001 | | 40RRB/KWA/GH/RAP15/TB10/001 | |
| Supplier's Mix No. | 10RWC/KWA/GH/RAP20/TB10/001 | | 20RWC/KWA/GH/RAP20/TB10/001 | | 28RBC/KWA/GH/RAP20/TB10/001 | | 40RBC/KWA/GH/RAP20/TB10/001 | | 40RRB/KWA/GH/RAP15/TB10/001 | |
| Date of Design | 19-Dec-2023 | | 02-Jan-2024 | | 29-Jan-2024 | | 15-Jan-2024 | | 26-May-2025 | |
| Approval Date | 01-Mar-2024 | | 01-Mar-2024 | | 01-Mar-2024 | | 01-Mar-2024 | | 27-Jun-2025 | |
| Expiry Date | 28-Feb-2027 | | 28-Feb-2027 | | 28-Feb-2027 | | 28-Feb-2027 | | -- | |
| | Design Grading | PS Requirement* | Design Grading | PS Requirement* | Design Grading | PS Requirement* | Design Grading | PS Requirement* | Design Data | GS Requirement* |
| Binder content ( % ) | 6.5 | 6.0 - 7.0 | 5.5 | 5.0 - 6.0 | 5.0 | 4.5 - 5.5 | 4.5 | 4.0 - 5.0 | 4.0 | 3.5 - 4.5 |
| B.S. Sieve (mm) | % Passing | | % Passing | | % Passing | | % Passing | | % Passing | |
| 50 | | | | | | | 100 | 100 | 100 | 100 |
| 37.5 | | | | | 100 | 100 | 98 | 94 - 100 | 97 | 90 - 100 |
| 28 | | | 100 | 100 | 97 | 93 - 100 | 93 | 86 - 100 | 89 | 70 - 94 |
| 20 | | | 96 | 92 - 100 | 88 | 81 - 95 | 83 | 76 - 90 | 78 | 62 - 84 |
| 14 | 100 | 100 | 87 | 80 - 94 | 76 | 69 - 83 | 73 | 66 - 80 | -- | -- |
| 10 | 96 | 92 - 100 | 81 | 74 - 88 | 65 | 58 - 72 | 66 | 59 - 73 | 58 | 49 - 67 |
| 5 | 74 | 67 - 81 | 66 | 59 - 73 | 50 | 43 - 57 | 53 | 46 - 60 | 44 | 37 - 55 |
| 2.36 | 53 | 46 - 60 | 48 | 41 - 55 | 38 | 31 - 45 | 41 | 34 - 48 | 32 | 27 - 43 |
| 1.18 | 38 | 31 - 45 | 36 | 29 - 43 | 29 | 22 - 36 | 31 | 24 - 38 | -- | -- |
| 0.60 | 28 | 23 - 33 | 25 | 20 - 30 | 21 | 16 - 26 | 23 | 18 - 28 | 20 | 13 - 28 |
| 0.30 | 18 | 13 - 23 | 17 | 12 - 22 | 14 | 9 - 19 | 16 | 11 - 21 | 14 | 7 - 21 |
| 0.15 | 11 | 8 - 14 | 11 | 8 - 14 | 9 | 6 - 12 | 10 | 7 - 13 | -- | -- |
| 0.075 | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.9 | 4.9 - 8.9<br>9.9[#] | 5.4 | 3.4 - 7.4<br>8.4[#] | 6.3 | 4.3 - 8.3<br>9.3[#] | 6.1 | 2.0 - 8.0<br>8.0[@] |
| | (including 20% RAP) | | (including 20% RAP) | | (including 20% RAP) | | (including 20% RAP) | | (including 15% RAP) | |
| | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | |
| Air voids in mix, VIM (%) | 3.3 | 3.0 - 5.0 | 4.0 | 3.0 - 5.0 | 3.8 | 3.0 - 5.0 | 4.0 | 3.0 - 5.0 | -- | -- |
| Voids in mineral aggregate, VMA (%) | 17.6 | ≧16 | 16.0 | ≧14 | 15.0 | ≧13 | 14.1 | ≧12.5 | -- | -- |
| Marshall stability (kN) | 12.3 | ≧10 | 14.2 | ≧10 | 14.1 | ≧10 | 17.4 | ≧10 | -- | -- |
| Flow (mm) | 4.0 | ≦4.0 | 3.7 | ≦4.0 | 3.9 | ≦4.0 | 4.0 | ≦4.0 | -- | -- |

* For reference only

[#] The percentage passing the 0.075mm BS sieve shall not deviate from the approved design value by more than 3%.

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(Polymer Modified Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** | | | |
|---|---|---|---|---|---|
| | | 10PMFC/KWA/GH/PG/001 | CC/KWA/GH/PG/001 | 10PMSMA/KWA/GH/PG/ITF/75/001 | 6PMSMA/KWA/GH&BQ/PG/ITF/75/001 |
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Grade PG76 | | | |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) | Not applicable | Crushed rock (Granite) | |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) | | | |
| | Bontique Quarry, China | Not applicable | | | Crushed rock (Limestone) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China<br>Hydrated Lime - Great Wall Brand, China | Mixture of crushed rock filler and hydrated lime | | | |
| Fibre | Iterchimica S.p.A., Italy | Not applicable | | Cellulose Fibre | |

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/KWA/GH/PG/001 | | CC/KWA/GH/PG/001 | | 10PMSMA/KWA/GH/PG/ITF/75/001 | | 6PMSMA/KWA/GH&BQ/PG/ITF/75/001 | |
| Supplier's Mix No. | 10PMFC/KWA/GH/PG/001 | | CC/KWA/GH/PG/001 | | 10PMSMA/KWA/GH/PG/ITF/75/001 | | 6PMSMA/KWA/GH&BQ/PG/ITF/75/001 | |
| Date of Design | 28-Oct-2023 | | 09-Nov-2023 | | 01-Nov-2023 | | 06-Nov-2023 | |
| Approval Date | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | | 15-Jan-2024 | |
| Expiry Date | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | | 14-Jan-2027 | |
| | Design Grading | PS Requirement* | Design Grading | PS Requirement* | Design grading | PS Requirement* | Design grading | PS Requirement* |
| Binder content ( % ) | 5.5 | 5.0 - 6.0 | 9.5 | 9.0 - 10.0 | 6.3 | 5.6 - 6.6 | 6.1 | 5.4 - 6.4 |
| B.S. Sieve (mm) | % passing | | % passing | | % Passing | | % Passing | |
| 14 | 100 | 100 | | | 100 | 100 | 100 | 100 |
| 10 | 96 | 92 - 100 | | | 96 | 92 - 100 | 99 | 95 - 100 |
| 6.3 | -- | -- | 100 | 100 | -- | -- | -- | -- |
| 5 | 24 | 17 - 31 | -- | -- | 31 | 24 - 38 | 80 | 73 - 87 |
| 3.35 | -- | -- | 96 | 92 - 100 | -- | -- | -- | -- |
| 2.36 | 12 | 5 - 19 | -- | -- | 23 | 16 - 30 | 24 | 17 - 31 |
| 1.18 | -- | -- | 58 | 51 - 65 | -- | -- | 16 | 9 - 23 |
| 0.30 | -- | -- | 33 | 28 - 38 | -- | -- | -- | -- |
| 0.075 | 2.9 | 0.9 - 4.9<br>5.9# | 15.0 | 13.0 - 17.0<br>18.0# | 11.0 | 9.0 - 13.0<br>14.0# | 7.1 | 5.1 - 9.1<br>10.1# |
| | (including 1.5% hydrated lime) | | (including 2% hydrated lime) | | (including 2% hydrated lime) | | (including 2% hydrated lime) | |
| | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | |
| Air voids in mix, VIM (%) | 21.9 | ≧20 | -- | -- | 4.3 | 3.5 - 4.5 | 8.9 | 7.0 - 10.0 |
| Voids in mineral aggregate, VMA (%) | -- | -- | -- | -- | 18.0 | ≧17 | 21.8 | ≧17 |
| Marshall stability (kN) | -- | -- | -- | -- | 11.4 | ≧6 | 12.0 | ≧6 |
| Binder draindown ( % ) | -- | -- | -- | -- | 0.1 | ≦0.3 | 0.1 | ≦0.3 |
| Marshall quotient (kN/mm) | -- | -- | 0.9 | 0.7 - 1.2 | -- | -- | -- | -- |
| Binder drainage test | Pass | Tmax > Binder content | -- | -- | -- | -- | -- | -- |

***** For reference only

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

Updated as at 01 September 2025

**Summary of Provisionally Approved Mix Designs**
**K. Wah Asphalt Limited**
**(Highly Modified Mix)**

1. Source and Type of Constituent Materials :

| **Constituent Material** | **Source** | **Type** | | | |
|---|---|---|---|---|---|
| | | 10HMFC/KWA/GH/001 | HMCC/KWA/GH/001 | 10HMSMA/KWA/GH/ITF/75/001 | 6HMSMA/KWA/GH&BQ/ITF/75/001 |
| Bitumen | DongGuan TaiHe Asphalt Co., Ltd. | Polymer modified Super PG82 | | | |
| Coarse Aggregate (retained on 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) | Not applicable | Crushed rock (Granite) | |
| Fine Aggregate (passing 5mm BS sieve) | Guan Hong Quarry, China | Crushed rock (Granite) | | | |
| | Bontique Quarry, China | Not applicable | | | Crushed rock (Limestone) |
| Filler (passing 75 $\mu$m BS sieve) | Guan Hong Quarry, China<br>Hydrated Lime - Great Wall Brand, China | Mixture of crushed rock filler and hydrated lime | | | |
| Fibre | Iterchimica S.p.A., Italy | Not applicable | | Cellulose Fibre | |

2. Mix Designs :

| **Bituminous Material** | **10mm Highly Modified Friction Course** | | **3.35mm Highly Modified Cushion Course** | | **10mm Highly Modified Stone Mastic Asphalt** | | **6mm Highly Modified Stone Mastic Asphalt** | |
|---|---|---|---|---|---|---|---|---|
| HyD Mix No. | 10HMFC/KWA/GH/001 | | HMCC/KWA/GH/001 | | 10HMSMA/KWA/GH/ITF/75/001 | | 6HMSMA/KWA/GH&BQ/ITF/75/001 | |
| Supplier's Mix No. | 10HMFC/KWA/GH/001 | | HMCC/KWA/GH/001 | | 10HMSMA/KWA/GH/ITF/75/001 | | 6HMSMA/KWA/GH&BQ/ITF/75/001 | |
| Date of Design | 14-Nov-2023 | | 18-Dec-2024 | | 16-Nov-2023 | | 18-Nov-2023 | |
| Approval Date | 12-Jan-2024 | | 23-Jan-2025 | | 12-Jan-2024 | | 12-Jan-2024 | |
| Expiry Date | 11-Jan-2027 | | 22-Jan-2028 | | 11-Jan-2027 | | 11-Jan-2027 | |
| | Design Grading | PS Requirement* | Design Grading | PS Requirement* | Design grading | PS Requirement* | Design grading | PS Requirement* |
| Binder content ( % ) | 5.5 | 5.0 - 6.0 | 9.5 | 9.0 - 10.0 | 6.3 | 5.6 - 6.6 | 6.1 | 5.4 - 6.4 |
| B.S. Sieve (mm) | % passing | | % passing | | % Passing | | % Passing | |
| 14 | 100 | 100 | | | 100 | 100 | 100 | 100 |
| 10 | 96 | 92 - 100 | | | 96 | 92 - 100 | 99 | 95 - 100 |
| 6.3 | -- | -- | 100 | 100 | -- | -- | -- | -- |
| 5 | 24 | 17 - 31 | -- | -- | 31 | 24 - 38 | 80 | 73 - 87 |
| 3.35 | -- | -- | 96 | 92 - 100 | -- | -- | -- | -- |
| 2.36 | 12 | 5 - 19 | -- | -- | 23 | 16 - 30 | 24 | 17 - 31 |
| 1.18 | -- | -- | 58 | 51 - 65 | -- | -- | 16 | 9 - 23 |
| 0.30 | -- | -- | 33 | 28 - 38 | -- | -- | -- | -- |
| 0.075 | 2.9 | 0.9 - 4.9<br>5.9# | 15.0 | 13.0 - 17.0<br>18.0# | 11.0 | 9.0 - 13.0<br>14.0# | 7.1 | 5.1 - 9.1<br>10.1# |
| | (including 1.5% hydrated lime) | | (including 2% hydrated lime) | | (including 2% hydrated lime) | | (including 2% hydrated lime) | |
| | Marshall Properties | | Marshall Properties | | Marshall Properties | | Marshall Properties | |
| Air voids in mix, VIM (%) | 22.4 | ≧20 | -- | -- | 4.0 | 3.5 - 4.5 | 8.7 | 7.0 - 9.0 |
| Voids in mineral aggregate, VMA (%) | -- | -- | -- | -- | 17.9 | ≧17 | 21.7 | ≧17 |
| Marshall stability (kN) | -- | -- | -- | -- | 14.2 | ≧6 | 12.3 | ≧6 |
| Binder draindown ( % ) | -- | -- | -- | -- | 0.1 | ≦0.3 | 0.1 | ≦0.3 |
| Marshall quotient (kN/mm) | -- | -- | 0.9 | 0.7 - 1.2 | -- | -- | -- | -- |
| Binder drainage test | Pass | Tmax > Binder content | -- | -- | -- | -- | -- | -- |

* For reference only

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