

**Index of Provisionally Approved Mix Designs  
Hong Kong Asphalt (Green) Limited**

**I. Normal Mix**

| <b>Bituminous Material</b>   | <b>HyD Mix No.</b> | <b>Supplier's Mix No.</b> | <b>Date of Design</b> | <b>Approval Date</b> | <b>Expiry Date</b> |
|------------------------------|--------------------|---------------------------|-----------------------|----------------------|--------------------|
| 10mm Friction Course         | 10FC/HKA/LT/001    | 10FC/HKA/LT/001           | 9-Jun-2011            | 4-Jul-2011           | 3-Jul-2014         |
| 10mm Wearing Course          | 10WC/HKA/LT/001    | 10WC/HKA/LT/001           | 25-Nov-2011           | 12-Dec-2011          | 11-Dec-2014        |
| 20mm Wearing Course          | 20WC/HKA/LT/001    | 20WC/HKA/LT/001           | 4-Nov-2011            | 7-Dec-2011           | 6-Dec-2014         |
| 28mm Base Course             | 28BC/HKA/LT/001    | 28BC/HKA/LT/001           | 8-Dec-2011            | 13-Jan-2012          | 12-Jan-2015        |
| 37.5mm Base Course           | 40BC/HKA/LT/001    | 40BC/HKA/LT/001           | 3-Jan-2012            | 8-Feb-2012           | 7-Feb-2015         |
| 37.5mm Roadbase (recipe mix) | ---                | ---                       | ---                   | --                   | --                 |

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

| <b>Bituminous Material</b>   | <b>HyD Mix No.</b>  | <b>Supplier's Mix No.</b> | <b>Date of Design</b> | <b>Approval Date</b> | <b>Expiry Date</b> |
|------------------------------|---------------------|---------------------------|-----------------------|----------------------|--------------------|
| 10mm Wearing Course          | 10WC/HKA/LT/RAP/001 | 10WC/HKA/LT/RAP/001       | 26-May-2011           | 10-Jun-2011          | 9-Jun-2014         |
| 20mm Wearing Course          | 20WC/HKA/LT/RAP/001 | 20WC/HKA/LT/RAP/001       | 25-Mar-2011           | 3-May-2011           | 2-May-2014         |
| 28mm Base Course             | 28BC/HKA/LT/RAP/001 | 28BC/HKA/LT/RAP/001       | 7-Apr-2011            | 3-May-2011           | 2-May-2014         |
| 37.5mm Base Course           | 40BC/HKA/LT/RAP/001 | 40BC/HKA/LT/RAP/001       | 2-Jun-2011            | 4-Jul-2011           | 3-Jul-2014         |
| 37.5mm Roadbase (recipe mix) | 40RB/HKA/LT/RAP/001 | 40RB/HKA/LT/RAP/001       | 14-Apr-2011           | --                   | --                 |

**III. Polymer Modified Mix**

| <b>Bituminous Material</b>             | <b>HyD Mix No.</b>   | <b>Supplier's Mix No.</b> | <b>Date of Design</b> | <b>Approval Date</b> | <b>Expiry Date</b> |
|--|----------------------|---------------------------|-----------------------|----------------------|--------------------|
| 10mm Polymer Modified Friction Course  | 10PMFC/HKA/LT/PG/001 | 10PMFC/HKA/LT/PG/001      | 31-Mar-2011           | 3-May-2011           | 2-May-2014         |
| 3.35mm Polymer Modified Cushion Course | CC/HKA/LT/PG/001     | CC/HKA/LT/PG/001          | 5-May-2011            | 19-May-2011          | 18-May-2014        |

**IV. Special Mix**

| <b>Bituminous Material</b> | <b>HyD Mix No.</b>      | <b>Supplier's Mix No.</b> | <b>Date of Design</b> | <b>Approval Date</b> | <b>Expiry Date</b> |
|----------------------------|-------------------------|---------------------------|-----------------------|----------------------|--------------------|
| 20mm Stone Mastic Asphalt  | 20SMA/HKA/LT/TOP/75/001 | 20SMA/HKA/LT/TOP/75/001   | 28-Apr-2011           | 30-May-2011          | 29-May-2014        |
| 10mm Stone Mastic Asphalt  | 10SMA/HKA/LT/TOP/75/001 | 10SMA/HKA/LT/TOP/75/001   | 28-Jul-2011           | 10-Aug-2011          | 9-Aug-2014         |
| 10mm Stone Mastic Asphalt  | 10SMA/HKA/LT/TOP/001    | 10SMA/HKA/LT/TOP/001      | 10-Mar-2011           | 3-May-2011           | 2-May-2014         |

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

**Summary of Provisionally Approved Mix Designs  
Hong Kong Asphalt (Green) Limited  
(Normal Mix)**

1. Plant Location : Lung Kwu Sheung Tan
2. Source and Type of Constituent Materials :

| Constituent Material                           | Source  | Type   |
|--|---|--|
| Bitumen  | Dongguan Taihe Asphalt Co. Ltd., China                            | Grade 60/70 pen  |
| Coarse Aggregate<br>(retained on 5mm BS sieve) | K. Wah Quarry, Lam Tei  | Crushed rock (Granite)   |
| Fine Aggregate<br>(passing 5mm BS sieve)       | K. Wah Quarry, Lam Tei  | Crushed rock (Granite)   |
| Filler<br>(passing 75 $\mu$ m BS sieve)        | K. Wah Quarry, Lam Tei<br>Hydrated Lime - Great Wall Brand, China | Crushed rock filler for WC & BC<br>Mixture of crushed rock filler and hydrated lime for FC |

3. Mix Designs :

| Bituminous Material                 | 10mm Friction Course           |                 | 10mm Wearing Course |                   | 20mm Wearing Course |                 | 28mm Base Course    |                   | 37.5mm Base Course  |                  | 37.5mm Roadbase (recipe mix) |                  |
|-------------------------------------|--------------------------------|-----------------|---------------------|-------------------|---------------------|-----------------|---------------------|-------------------|---------------------|------------------|------------------------------|------------------|
|                                     | HyD Mix No.                    | 10FC/HKA/LT/001 | 10WC/HKA/LT/001     | 20WC/HKA/LT/001   | 28BC/HKA/LT/001     | 40BC/HKA/LT/001 | 40BC/HKA/LT/001     | 40BC/HKA/LT/001   | 40BC/HKA/LT/001     | 40BC/HKA/LT/001  | ---                          | ---              |
| Supplier's Mix No.                  | 10FC/HKA/LT/001                | 10WC/HKA/LT/001 | 10WC/HKA/LT/001     | 20WC/HKA/LT/001   | 28BC/HKA/LT/001     | 40BC/HKA/LT/001 | 40BC/HKA/LT/001     | 40BC/HKA/LT/001   | 40BC/HKA/LT/001     | 40BC/HKA/LT/001  | ---                          | ---              |
| Date of Design                      | 9-Jun-2011                     | 25-Nov-2011     | 25-Nov-2011         | 4-Nov-2011        | 8-Dec-2011          | 3-Jan-2012      | 3-Jan-2012          | 3-Jan-2012        | 3-Jan-2012          | 3-Jan-2012       | ---                          | ---              |
| Approval Date                       | 4-Jul-2011                     | 12-Dec-2011     | 12-Dec-2011         | 7-Dec-2011        | 13-Jan-2012         | 8-Feb-2012      | 8-Feb-2012          | 8-Feb-2012        | 8-Feb-2012          | 8-Feb-2012       | --                           | --               |
| Expiry Date                         | 3-Jul-2014                     | 11-Dec-2014     | 11-Dec-2014         | 6-Dec-2014        | 12-Jan-2015         | 7-Feb-2015      | 7-Feb-2015          | 7-Feb-2015        | 7-Feb-2015          | 7-Feb-2015       | --                           | --               |
|                                     | Design Grading                 | GS Requirement* | Design Grading      | GS Requirement*   | Design Grading      | GS Requirement* | Design Grading      | GS Requirement*   | Design Grading      | GS Requirement*  | Design Data                  | GS Requirement*  |
| Binder content ( % )                | 4.5                            | 4.0 - 5.0       | 6.0                 | 5.5 - 6.5         | 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           |                  | % Passing                    |                  |
| 50                                  |                                |                 |                     |                   |                     |                 |                     |                   | 100                 | 100              | ---                          | ---              |
| 37.5                                |                                |                 |                     |                   |                     |                 | 100                 | 100               | 99                  | 95 - 100         | ---                          | ---              |
| 28                                  |                                |                 |                     |                   | 100                 | 100             | 96                  | 92 - 100          | 91                  | 84 - 98          | ---                          | ---              |
| 20                                  |                                |                 |                     |                   | 99                  | 95 - 100        | 89                  | 82 - 96           | 78                  | 71 - 85          | ---                          | ---              |
| 14                                  | 100                            | 100             | 100                 | 100               | 87                  | 80 - 94         | 77                  | 70 - 84           | 67                  | 60 - 74          | --                           | --               |
| 10                                  | 94                             | 90 - 98         | 99                  | 95 - 100          | 76                  | 69 - 83         | 65                  | 58 - 72           | 57                  | 50 - 64          | ---                          | ---              |
| 5                                   | 21                             | 14 - 28         | 71                  | 64 - 78           | 65                  | 58 - 72         | 45                  | 38 - 52           | 48                  | 41 - 55          | ---                          | ---              |
| 2.36                                | 11                             | 4 - 18          | 48                  | 41 - 55           | 47                  | 40 - 54         | 30                  | 23 - 37           | 35                  | 28 - 42          | ---                          | ---              |
| 1.18                                | --                             | --              | 35                  | 28 - 42           | 34                  | 27 - 41         | 22                  | 15 - 29           | 26                  | 19 - 33          | --                           | --               |
| 0.600                               | --                             | --              | 26                  | 21 - 31           | 25                  | 20 - 30         | 16                  | 11 - 21           | 19                  | 14 - 24          | ---                          | ---              |
| 0.300                               | --                             | --              | 18                  | 13 - 23           | 18                  | 13 - 23         | 12                  | 7 - 17            | 14                  | 9 - 19           | ---                          | ---              |
| 0.150                               | --                             | --              | 12                  | 9 - 15            | 12                  | 9 - 15          | 8                   | 5 - 11            | 10                  | 7 - 13           | --                           | --               |
| 0.075                               | 4.0                            | 2.0 - 6.0       | 7.7                 | 5.7 - 9.7         | 7.6                 | 5.6 - 9.6       | 4.9                 | 2.9 - 6.9         | 6.5                 | 4.5 - 8.5        | ---                          | ---              |
|                                     |                                |                 |                     | 10.7 <sup>#</sup> |                     |                 |                     | 10.6 <sup>#</sup> |                     | 9.5 <sup>#</sup> |                              | 8.0 <sup>@</sup> |
|                                     | (including 2.0% hydrated lime) |                 |                     |                   |                     |                 |                     |                   |                     |                  |                              |                  |
|                                     | Marshall Properties            |                 | Marshall Properties |                   | Marshall Properties |                 | Marshall Properties |                   | Marshall Properties |                  | Marshall Properties          |                  |
| Air voids in mix, VIM (%)           | 22.6                           | 18 - 25         | 3.8                 | 3.0 - 5.0         | 4.3                 | 3.0 - 5.0       | 4.9                 | 3.0 - 5.0         | 4.7                 | 3.0 - 5.0        | --                           | --               |
| Voids in mineral aggregate, VMA (%) | 30.5                           | $\geq 25$       | 16.8                | $\geq 16$         | 15.1                | $\geq 14$       | 14.6                | $\geq 13$         | 13.6                | $\geq 12.5$      | --                           | --               |
| Marshall stability (kN)             | --                             | --              | 10.3                | $\geq 10$         | 14.7                | $\geq 10$       | 12.4                | $\geq 10$         | 14.3                | $\geq 10$        | --                           | --               |
| Flow (mm)                           | --                             | --              | 3.1                 | $\leq 4.0$        | 2.5                 | $\leq 4.0$      | 2.9                 | $\leq 4.0$        | 2.5                 | $\leq 4.0$       | --                           | --               |

\* 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  
Hong Kong Asphalt (Green) Limited  
(RAP Mix)**

- Plant Location : Lung Kwu Sheung Tan
- Source and Type of Constituent Materials :

| Constituent Material                           | Source                                 | Type                   |
|--|--|------------------------|
| Bitumen  | Dongguan Taihe Asphalt Co. Ltd., China | Grade 60/70 pen        |
| Coarse Aggregate<br>(retained on 5mm BS sieve) | K. Wah Quarry, Lam Tei                 | Crushed rock (Granite) |
| Fine Aggregate<br>(passing 5mm BS sieve)       | K. Wah Quarry, Lam Tei                 | Crushed rock (Granite) |
| Filler<br>(passing 75 $\mu$ m BS sieve)        | K. Wah Quarry, Lam Tei                 | Crushed rock filler    |

- 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/HKA/LT/RAP/001 |                                | 20WC/HKA/LT/RAP/001 |                                | 28BC/HKA/LT/RAP/001 |                               | 40BC/HKA/LT/RAP/001 |                               | 40RB/HKA/LT/RAP/001          |                               |
| Supplier's Mix No.                  | 10WC/HKA/LT/RAP/001 |                                | 20WC/HKA/LT/RAP/001 |                                | 28BC/HKA/LT/RAP/001 |                               | 40BC/HKA/LT/RAP/001 |                               | 40RB/HKA/LT/RAP/001          |                               |
| Date of Design                      | 26-May-2011         |                                | 25-Mar-2011         |                                | 7-Apr-2011          |                               | 2-Jun-2011          |                               | 14-Apr-2011                  |                               |
| Approval Date                       | 10-Jun-2011         |                                | 3-May-2011          |                                | 3-May-2011          |                               | 4-Jul-2011          |                               | --                           |                               |
| Expiry Date                         | 9-Jun-2014          |                                | 2-May-2014          |                                | 2-May-2014          |                               | 3-Jul-2014          |                               | --                           |                               |
|                                     | 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                     | 4.0                 | 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                            | 95                  | 91 - 99                       | 81                  | 74 - 88                       | 87                           | 70 - 94                       |
| 20                                  |                     |                                | 98                  | 94 - 100                       | 89                  | 82 - 96                       | 67                  | 60 - 74                       | 76                           | 62 - 84                       |
| 14                                  | 100                 | 100                            | 85                  | 78 - 92                        | 77                  | 70 - 84                       | 59                  | 52 - 66                       | --                           | --                            |
| 10                                  | 94                  | 90 - 98                        | 76                  | 69 - 83                        | 65                  | 58 - 72                       | 54                  | 47 - 61                       | 58                           | 49 - 67                       |
| 5                                   | 65                  | 58 - 72                        | 64                  | 57 - 71                        | 42                  | 35 - 49                       | 42                  | 35 - 49                       | 46                           | 37 - 55                       |
| 2.36                                | 48                  | 41 - 55                        | 47                  | 40 - 54                        | 30                  | 23 - 37                       | 31                  | 24 - 38                       | 34                           | 27 - 43                       |
| 1.18                                | 34                  | 27 - 41                        | 34                  | 27 - 41                        | 22                  | 15 - 29                       | 23                  | 16 - 30                       | --                           | --                            |
| 0.600                               | 25                  | 20 - 30                        | 25                  | 20 - 30                        | 16                  | 11 - 21                       | 17                  | 12 - 22                       | 18                           | 13 - 28                       |
| 0.300                               | 18                  | 13 - 23                        | 18                  | 13 - 23                        | 12                  | 7 - 17                        | 13                  | 8 - 18                        | 13                           | 7 - 21                        |
| 0.150                               | 12                  | 9 - 15                         | 12                  | 9 - 15                         | 8                   | 5 - 11                        | 9                   | 6 - 12                        | --                           | --                            |
| 0.075                               | 7.2                 | 5.2 - 9.2<br>10.2 <sup>#</sup> | 7.1                 | 5.1 - 9.1<br>10.1 <sup>#</sup> | 4.5                 | 2.5 - 6.5<br>7.5 <sup>#</sup> | 5.4                 | 3.4 - 7.4<br>8.4 <sup>#</sup> | 5.1                          | 2.0 - 8.0<br>8.0 <sup>@</sup> |
|                                     | (including 15% RAP) |                                | (including 15% RAP) |                                | (including 15% RAP) |                               | (including 15% RAP) |                               | (including 15% RAP)          |                               |
|                                     | Marshall Properties |                                | Marshall Properties |                                | Marshall Properties |                               | Marshall Properties |                               | Marshall Properties          |                               |
| Air voids in mix, VIM (%)           | 4.2                 | 3.0 - 5.0                      | 4.1                 | 3.0 - 5.0                      | 4.8                 | 3.0 - 5.0                     | 4.1                 | 3.0 - 5.0                     | --                           | --                            |
| Voids in mineral aggregate, VMA (%) | 17.3                | $\geq 16$                      | 14.8                | $\geq 14$                      | 14.5                | $\geq 13$                     | 12.8                | $\geq 12.5$                   | --                           | --                            |
| Marshall stability (kN)             | 15.3                | $\geq 10$                      | 15.8                | $\geq 10$                      | 12.6                | $\geq 10$                     | 13.8                | $\geq 10$                     | --                           | --                            |
| Flow (mm)                           | 3.1                 | $\leq 4.0$                     | 3.2                 | $\leq 4.0$                     | 3.2                 | $\leq 4.0$                    | 3.5                 | $\leq 4.0$                    | --                           | --                            |

\* 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  
Hong Kong Asphalt (Green) Limited  
(Polymer Modified Mix)**

- Plant Location : Lung Kwu Sheung Tan
- Source and Type of Constituent Materials :

| Constituent Material                           | Source  | Type   |   |
|--|---|--|---|
| Bitumen  | Dongguan Taihe Asphalt Co. Ltd., China  | Grade PG76                                       |   |
| Coarse Aggregate<br>(retained on 5mm BS sieve) | K. Wah Quarry, Lam Tei  | Crushed rock (Granite)                           | Not applicable                                      |
| Fine Aggregate<br>(passing 5mm BS sieve)       | K. Wah Quarry, Lam Tei<br>River Sand - Superform International Investment Limited, Xin Hui, China | Crushed rock (Granite)                           | Mixture of crushed rock<br>(Granite) and river sand |
| Filler<br>(passing 75 $\mu$ m BS sieve)        | K. Wah Quarry, Lam Tei<br>Hydrated lime - Great Wall Brand, China                                 | Mixture of crushed rock filler and hydrated lime |   |

- Mix Designs :

| Bituminous Material                 | 10mm Polymer Modified Friction Course |                       | 3.35mm Polymer Modified Cushion Course |                 |
|-------------------------------------|---------------------------------------|-----------------------|--|-----------------|
| HyD Mix No.                         | 10PMFC/HKA/LT/PG/001                  |                       | CC/HKA/LT/PG/001                       |                 |
| Supplier's Mix No.                  | 10PMFC/HKA/LT/PG/001                  |                       | CC/HKA/LT/PG/001                       |                 |
| Date of Design                      | 31-Mar-2011                           |                       | 5-May-2011                             |                 |
| Approval Date                       | 3-May-2011                            |                       | 19-May-2011                            |                 |
| Expiry Date                         | 2-May-2014                            |                       | 18-May-2014                            |                 |
|                                     | Design Grading                        | PS Requirement*       | Design Grading                         | PS Requirement* |
| Polymer modified binder content (%) | 5.5                                   | 5.0 - 6.0             | 9.6                                    | 9.1 - 10.1      |
| B.S. Sieve (mm)                     | % passing                             |                       | % passing                              |                 |
| 14                                  | 100                                   | 100                   |  |                 |
| 10                                  | 94                                    | 90 - 98               |  |                 |
| 6.3                                 | --                                    | --                    | 100                                    | 100             |
| 5                                   | 21                                    | 14 - 28               | --                                     | --              |
| 3.35                                | --                                    | --                    | 95                                     | 91 - 99         |
| 2.36                                | 11                                    | 4 - 18                | --                                     | --              |
| 1.18                                | --                                    | --                    | 70                                     | 63 - 77         |
| 0.300                               | --                                    | --                    | 31                                     | 26 - 36         |
| 0.075                               | 4.0                                   | 2.0 - 6.0             | 12.4                                   | 10.4 - 14.4     |
|                                     | (including 2% hydrated lime)          |                       | (including 2% hydrated lime)           |                 |
|                                     | Marshall Properties                   |                       | Marshall Properties                    |                 |
| Air voids in mix, VIM (%)           | 21.7                                  | $\geq 20$             | --                                     | --              |
| Marshall quotient (kN/mm)           | --                                    | --                    | 1.2                                    | 0.7 - 1.2       |
| Binder drainage test                | Pass                                  | Tmax > Binder content | --                                     | --              |

\* For reference only

**Summary of Provisionally Approved Mix Designs  
Hong Kong Asphalt (Green) Limited  
(Special Mix)**

- Plant Location : Lung Kwu Sheung Tan
- Source and Type of Constituent Materials :

| Constituent Material                           | Source  | Type   |
|--|---|--|
| Bitumen  | Dongguan Taihe Asphalt Co. Ltd., China                            | Grade 60/70 pen                                  |
| Coarse Aggregate<br>(retained on 5mm BS sieve) | K. Wah Quarry, Lam Tei  | Crushed rock (Granite)                           |
| Fine Aggregate<br>(passing 5mm BS sieve)       | K. Wah Quarry, Lam Tei  | Crushed rock (Granite)                           |
| Filler<br>(passing 75 $\mu$ m BS sieve)        | K. Wah Quarry, Lam Tei<br>Hydrated Lime - Great Wall Brand, China | Mixture of crushed rock filler and hydrated lime |
| Fibre  | CFF GmbH & Co. KG (Germany)                                       | Cellulose Fibre (Topcel)                         |

- Mix Designs :

| Bituminous Material                 | 20mm Stone Mastic Asphalt    |                                 | 10mm Stone Mastic Asphalt    |                                 | 10mm Stone Mastic Asphalt    |                                 |
|-------------------------------------|------------------------------|---------------------------------|------------------------------|---------------------------------|------------------------------|---------------------------------|
|                                     | HyD Mix No.                  | 20SMA/HKA/LT/TOP/75/001         |                              | 10SMA/HKA/LT/TOP/75/001         |                              | 10SMA/HKA/LT/TOP/001            |
| Supplier's Mix No.                  | 20SMA/HKA/LT/TOP/75/001      |                                 | 10SMA/HKA/LT/TOP/75/001      |                                 | 10SMA/HKA/LT/TOP/001         |                                 |
| Date of Design                      | 28-Apr-2011                  |                                 | 28-Jul-2011                  |                                 | 10-Mar-2011                  |                                 |
| Approval Date                       | 30-May-2011                  |                                 | 10-Aug-2011                  |                                 | 03-May-2011                  |                                 |
| Expiry Date                         | 29-May-2014                  |                                 | 09-Aug-2014                  |                                 | 02-May-2014                  |                                 |
|                                     | Design grading               | PS Requirement*                 | Design grading               | PS Requirement*                 | Design grading               | PS Requirement*                 |
| Binder content ( % )                | 5.8                          | 5.1 - 6.1                       | 6.0                          | 5.3 - 6.3                       | 6.0                          | 5.5 - 6.5                       |
| B.S. Sieve (mm)                     | % Passing                    |                                 | % Passing                    |                                 | % Passing                    |                                 |
| 28                                  | 100                          | 100                             |                              |                                 |                              |                                 |
| 20                                  | 98                           | 94 - 100                        |                              |                                 |                              |                                 |
| 14                                  | 88                           | 81 - 95                         | 100                          | 100                             | 100                          | 100                             |
| 10                                  | 72                           | 65 - 79                         | 96                           | 92 - 100                        | 94                           | 90 - 98                         |
| 5                                   | 26                           | 19 - 33                         | 34                           | 27 - 41                         | 34                           | 27 - 41                         |
| 2.36                                | 19                           | 12 - 26                         | 25                           | 18 - 32                         | 25                           | 18 - 32                         |
| 1.18                                | --                           | --                              | --                           | --                              | --                           | --                              |
| 0.600                               | 14                           | 9 - 19                          | --                           | --                              | --                           | --                              |
| 0.300                               | 12                           | 7 - 17                          | --                           | --                              | --                           | --                              |
| 0.150                               | --                           | --                              | --                           | --                              | --                           | --                              |
| 0.075                               | 9.1                          | 7.1 - 11.1<br>12.1 <sup>#</sup> | 8.6                          | 6.6 - 10.6<br>11.6 <sup>#</sup> | 8.4                          | 6.4 - 10.4<br>11.4 <sup>#</sup> |
|                                     | (including 2% hydrated lime) |                                 | (including 2% hydrated lime) |                                 | (including 2% hydrated lime) |                                 |
|                                     | Marshall Properties          |                                 | Marshall Properties          |                                 | Marshall Properties          |                                 |
| Air voids in mix, VIM (%)           | 4.1                          | 3.0 - 4.5                       | 3.7                          | 3.0 - 4.5                       | 4.2                          | 3.0 - 4.5                       |
| Voids in mineral aggregate, VMA (%) | 17.0                         | $\geq$ 17                       | 17.0                         | $\geq$ 17                       | 17.3                         | $\geq$ 17                       |
| Marshall stability (kN)             | 8.9                          | $\geq$ 6                        | 7.4                          | $\geq$ 6                        | 9.1                          | $\geq$ 6                        |
| Flow (mm)                           | 3.1                          | $\leq$ 4                        | 3.5                          | $\leq$ 4                        | 3.3                          | $\leq$ 4                        |
| Binder draindown ( % )              | 0.06                         | $\leq$ 0.3                      | 0.04                         | $\leq$ 0.3                      | 0.08                         | $\leq$ 0.3                      |

\* 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%.