STANDARD PAVEMENT SUBSURFACE DRAINAGE DETAILS

VOLUME 1 - DESIGN AND LOCATION

related drawings:
VOLUME 2 - GRANULAR PAVEMENT WITH BITUMINOUS SURFACING DETAILS
VOLUME 3 - FULL DEPTH ASPHALT PAVEMENT DETAILS
VOLUME 4 - ASPHALT OVER BOUND SUBBASE PAVEMENT DETAILS
VOLUME 5 - RIGID PAVEMENT DETAILS
VOLUME 6 - SUPPLEMENTARY MODEL DRAWINGS
### REVISION REGISTER

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<thead>
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<td>26/08/2005</td>
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### INDEX

<table>
<thead>
<tr>
<th>CROSS SECTION</th>
<th>SHEET</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSP1</td>
<td>05</td>
<td>Soil Cutting with 'SO' Gutter and Drainage Layer Narrow Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP2</td>
<td>05</td>
<td>Soil Cutting with 'SO' Gutter and Drainage Layer Depressed Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP3</td>
<td>06</td>
<td>Soil Cutting with 'SO' Gutter and Drainage Layer Depressed Median and Full Superelevation</td>
</tr>
<tr>
<td>XSP4</td>
<td>05</td>
<td>Soil Cutting with Table Drain and Drainage Layer Depressed Median and Full Superelevation</td>
</tr>
<tr>
<td>XSP5</td>
<td>07</td>
<td>Soil Cutting with 'SO' Gutter and No Drainage Layer Depressed Median with Normal Crossfall</td>
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<tr>
<td>XSP6</td>
<td>07</td>
<td>Soil Cutting with Table Drain and No Drainage Layer Depressed Median with Normal Crossfall</td>
</tr>
<tr>
<td>XSP7</td>
<td>08</td>
<td>Soil Cutting with Table Drain and No Drainage Layer Depressed Median with Full Superelevation</td>
</tr>
<tr>
<td>XSP8</td>
<td>08</td>
<td>Embankment with 'SO' Gutter and Safety Barrier Narrow Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP9</td>
<td>09</td>
<td>Embankment with 'SO' Gutter and Safety Barrier Depressed Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP10</td>
<td>09</td>
<td>Embankment with 'SO' Gutter and Safety Barrier Depressed Median and Full Superelevation</td>
</tr>
<tr>
<td>XSP11</td>
<td>10</td>
<td>Embankment with No 'SO' Gutter and Safety Barrier Depressed Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP12</td>
<td>10</td>
<td>Embankment with No 'SO' Gutter and Safety Barrier Depressed Median and Full Superelevation</td>
</tr>
<tr>
<td>XSP13</td>
<td>11</td>
<td>Side Cutting and Embankment on Natural Cross Slope Depressed Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP14</td>
<td>11</td>
<td>Hard Rock Cutting with 'SO' Gutter and Drainage Layer Depressed Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP15</td>
<td>12</td>
<td>Urban Section: 30m Road Reserve Width Raised Median and Normal Crossfall</td>
</tr>
<tr>
<td>XSP16</td>
<td>12</td>
<td>Urban Section: Variable Road Reserve Width Raised Median and Full Superelevation</td>
</tr>
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</table>

* DENOTES PRINCIPAL ROAD PAVEMENT AND GEOTECHNICAL ENGINEER
<table>
<thead>
<tr>
<th>Specification</th>
<th>Title</th>
<th>Associated Drawings</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R15</td>
<td>Kerbs and Gutters</td>
<td>MO.R33.A04</td>
<td>Construction of Kerb and Gutter</td>
</tr>
<tr>
<td>R33</td>
<td>Trench Drains</td>
<td>MO.R33.A06</td>
<td>Construction of trench drains</td>
</tr>
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<td></td>
<td></td>
<td>MO.R33.A07</td>
<td>Stage construction of trench drains</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MO.R33.A08</td>
<td>Combined stormwater and subsurface drainage layout</td>
</tr>
<tr>
<td>R37</td>
<td>Intra-pavement Drains</td>
<td>MO.R37.A01</td>
<td>Construction of intra-pavement drains</td>
</tr>
<tr>
<td>R44</td>
<td>Earthworks</td>
<td>MO.R44.A01</td>
<td>Specified drainage works at the subgrade/earthworks interface</td>
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<tr>
<td>R83</td>
<td>Geotextiles (Separation and Filtration)</td>
<td>MO.R33.A04</td>
<td>Specifies geotextile requirements for trench and edge drains.</td>
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<tr>
<td>3222</td>
<td>No Fines Concrete (for Subsurface Drainage)</td>
<td>R33.R33.A04</td>
<td>For use in edge drains and trench drains.</td>
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<tr>
<td>3556</td>
<td>Rigid Strip Filters</td>
<td>R33.R33.A08</td>
<td>For use in trench drains.</td>
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</tbody>
</table>
TABLE 1 - OPTIONS FOR DESIGN OF TRENCH DRAINS

<table>
<thead>
<tr>
<th>Drain Grade (%)</th>
<th>Maximum Outlet Spacing (m)</th>
<th>Trench Width W^a</th>
<th>Minimum Aggregate Filter Material Size b</th>
<th>Pipe Required</th>
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<tr>
<td>0.5 to ≤ 1.0</td>
<td>50</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>&gt; 1.0 to ≤ 3.0</td>
<td>100^f</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
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<tr>
<td>&gt; 3.0 to ≤ 5.0</td>
<td>120</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
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<tr>
<td>&gt; 5.0</td>
<td>120</td>
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<td>Yes</td>
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Notes:

a. For trench drains used to drain pavement drainage layers, this table is not applicable and the design details are as given on the Standard Drawings.

b. No Fines Concrete (3222) can be substituted for any grade of aggregate filter material.

c. Where Class F5 aggregate filter material (3580) is used, a pipe must be used due to the likelihood of the drain clogging with fines.

d. Where Class F5 or Class F7 aggregate filter material is used with a corrugated perforated plastic drainage pipe (3552) or a rigid strip filter (3556), the pipe must be enclosed in a seamless tubular filter fabric (3553).

e. Pipe can be either 100mm nominal diameter corrugated perforated plastic pipe (3552) or 150mm high rig side filter (3556).

f. For grades greater than 2% the maximum outlet spacing may be increased to 120m.

g. Example conditions that may need to be considered include but are not limited to expansive subgrades, sand subgrades, suitable outlets, landscape areas, interface between new and existing pavements, permeability of materials etc.

h. Provide intra-pavement drains where pavement materials are sensitive to moisture and moisture is expected to travel within the pavement for a longitudinal distance in excess of five times the transverse distance (crown to longitudinal subsurface drain) and at cut/fill interfaces and at sags where excessive moisture is expected to accumulate.
NOTES

1. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.
2. DOES NOT EXTEND FOR THE FULL WIDTH OF CUTTING AND CUTTING IS WET.
3. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE DRAINAGE LAYER

PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.

1. CROSS SECTIONS XSP1 AND XSP2

SOIL CUTTING WITH 'SO' GUTTER AND DRAINAGE LAYER
NARROW MEDIAN AND NORMAL CROSSFALL
CROSS SECTION XSP1

NOT TO SCALE

SOIL CUTTING WITH 'SO' GUTTER AND DRAINAGE LAYER
DEPRESSED MEDIAN AND NORMAL CROSSFALL
CROSS SECTION XSP2

NOT TO SCALE

NOTES

1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
Details of pavement drainages are given in volumes 2 to 5.
2. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE DRAINAGE LAYER does not extend for the full width of cuttings and cutting is wet.
3. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.
NOTES

1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
   DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.

2. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE DRAINAGE LAYER
   DOES NOT EXTEND FOR THE FULL WIDTH OF CUTTING AND CUTTING IS WET.

3. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.

4. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT IN WET ENVIRONMENTS
   WITH FLAT GRATES/SOAK FALL.

CROSS SECTIONS XSP3 AND XSP4

SOIL CUTTING WITH 'SO' GUTTER AND DRAINAGE LAYER
DEPRESSED MEDIAN WITH FULL SUPERELEVATION
CROSS SECTION XSP3
NOT TO SCALE

SOIL CUTTING WITH TABLE DRAIN AND DRAINAGE LAYER
DEPRESSED MEDIAN WITH FULL SUPERELEVATION
CROSS SECTION XSP4
NOT TO SCALE
SOIL CUTTING WITH 'SO' GUTTER AND NO DRAINAGE LAYER
DEPRESSED MEDIAN WITH NORMAL CROSSFALL
CROSS SECTION XSP5
NOT TO SCALE

SOIL CUTTING WITH TABLE DRAIN AND NO DRAINAGE LAYER
DEPRESSED MEDIAN WITH NORMAL CROSSFALL
CROSS SECTION XSP6
NOT TO SCALE

NOTES:
1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
2. DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.
3. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE ADJACENT
   DEPRESSED MEDIAN DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED
   MATERIAL ZONE AND LONGITUDINAL GRADE OF DEPRESSED MEDIAN IS LESS
   THAN 2%.
SOIL CUTTING WITH TABLE DRAIN AND NO DRAINAGE LAYER

DEPRESSED MEDIAN WITH FULL SUPERELEVATION
CROSS SECTION XSP7
NOT TO SCALE

EMBANKMENT WITH 'SO' GUTTER AND SAFETY BARRIER
NARROW MEDIAN AND NORMAL CROSSFALL
CROSS SECTION XSP8
NOT TO SCALE

NOTES
1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
   DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.
2. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE ADJACENT
   DEPRESSED MEDIAN DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED
   MATERIAL ZONE AND LONGITUDINAL GRADE OF DEPRESSED MEDIAN IS LESS
   THAN 2%.
3. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE ADJACENT
   TABLE DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED MATERIAL ZONE.

See note 2
See note 3
EMBANKMENT WITH ‘SO’ GUTTER AND SAFETY BARRIER
DEPRESSED MEDIAN AND NORMAL CROSSFALL
CROSS SECTION XSP9
NOT TO SCALE

EMBANKMENT WITH ‘SO’ GUTTER AND SAFETY BARRIER
DEPRESSED MEDIAN AND FULL SUPERELEVATION
(AUXILIARY FEATURES INCLUDING TURNING LANES AND LAYBY)
CROSS SECTION XSP10
NOT TO SCALE

NOTES
1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
   DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.
2. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE ADJACENT
   DEPRESSED MEDIAN DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED
   MATERIAL ZONE AND LONGITUDINAL GRADE OF DEPRESSED MEDIAN IS LESS
   THAN 2%.

See note 2
EMBANKMENT WITH NO 'SO' GUTTER AND SAFETY BARRIER

DEPRESSED MEDIAN AND NORMAL CROSSFALL
CROSS SECTION XSP11
NOT TO SCALE

EMBANKMENT WITH NO 'SO' GUTTER AND NO SAFETY BARRIER

DEPRESSED MEDIAN AND FULL SUPERELEVATION
CROSS SECTION XSP12
NOT TO SCALE

NOTES:
1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.
2. DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.
3. PROVIDE TRENCH DRAIN ON HIGH SIDE OF PAVEMENT WHERE ADJACENT DEPRESSED MEDIAN DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED MATERIAL ZONE AND LONGITUDINAL GRADE OF DEPRESSED MEDIAN IS LESS THAN 2%.
NOTES

1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.

2. DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.

3. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.

4. PROVIDE DRAINAGE LAYER IN WET CUTTINGS WHERE ADJACENT DEPRESSED MEDIAN DRAIN INVERT IS ABOVE THE BASE OF THE SELECTED MATERIAL ZONE AND LONGITUDINAL GRADE OF DEPRESSED MEDIAN IS LESS THAN 2%.

CROSS SECTION XSP13

SIDE CUTTING AND EMBANKMENT ON NATURAL CROSS SLOPE
DEPRESSED MEDIAN AND NORMAL CROSSFALL

NOT TO SCALE

CROSS SECTION XSP14

HARD ROCK CUTTING WITH ‘SO’ GUTTER AND DRAINAGE LAYER
DEPRESSED MEDIAN AND NORMAL CROSSFALL

NOT TO SCALE
CROSS SECTIONS XSP15 AND XSP16 PROVIDE DRAINAGE LAYER IN WET CUTTINGS.

1. DETAILS OF PAVEMENT DRAINAGE ARE GIVEN IN VOLUMES 2 TO 5.

PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.

NOTES

1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.

2. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.

URBAN SECTION

30m ROAD RESERVE WIDTH

RAISED MEDIAN AND NORMAL CROSSFALL

CROSS SECTION XSP15

NOT TO SCALE

URBAN SECTION

VARIABLE ROAD RESERVE WIDTH

RAISED MEDIAN AND FULL SUPERELEVATION

CROSS SECTION XSP16

NOT TO SCALE

NOTES

1. PAVEMENT DRAINAGE DETAILS DEPEND ON THE PAVEMENT TYPE.

2. PROVIDE DRAINAGE LAYER IN WET CUTTINGS.