related drawings:
Volume CP - Plain Concrete Pavement
Volume CJ - Jointed Reinforced Concrete Pavement
The location of joints C7 and C7d may be selected on site to suit construction logistics.

Table C1.1 provides general comments regarding the applicability of specific sheets to contract drawings.

Table C1.2 provides information about the project-specific details which are required in the contract drawings.

Table C1.3 provides information about the design parameters which need not be specified in the contract drawings and which may be nominated on site. All other parameters must be specified by the designer.
### Table 2.1: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
</table>
| SFCP-R       | Steel Fibre Reinforced Concrete Pavement |}

### Table 2.2: Joint Type Numbers and Descriptions

<table>
<thead>
<tr>
<th>Type/Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRCP</td>
<td>Continuously Reinforced Concrete Pavement</td>
</tr>
<tr>
<td>PCP</td>
<td>Plain Concrete Pavement</td>
</tr>
<tr>
<td>PCP-D</td>
<td>Decorated Plain Concrete Pavement</td>
</tr>
<tr>
<td>PCP-R</td>
<td>Reinforced Plain Concrete Pavement (discrete slabs)</td>
</tr>
</tbody>
</table>

### Table 2.3: Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Joint type 'C1'</td>
</tr>
</tbody>
</table>

### Table 2.4: General Slab Shape Requirements

<table>
<thead>
<tr>
<th>Slab Shape Requirements</th>
<th>CRCP</th>
<th>PCP, PCP-R, SFCP, SFCP-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Corner Angles (°)</td>
<td>84° (80°)</td>
<td>70°</td>
</tr>
<tr>
<td>Slab Length L (meters)</td>
<td>L max</td>
<td>L min</td>
</tr>
<tr>
<td>Bar Width W (m) (a), (b), (c) (meters)</td>
<td>4.4 (4.5)</td>
<td>4.4 (4.5)</td>
</tr>
<tr>
<td>Shape Factor R = L / W</td>
<td>R max</td>
<td>R min</td>
</tr>
</tbody>
</table>

### Table 2.4 Notes:

(a) See Note 1 on sheet CC-03.
(b) Corner angles must be maximised wherever possible, see Note 16.
(c) Width is the largest square measure between longitudinal edges or joints, or the largest radial measure on curved slabs.
(d) Reserved.
(e) Reserved.
(f) Values in brackets show compromise limits for exclusive use by designers where their use is unavoidable.
(g) Tiebar numbers between joints or tiebar spacing in mm.
(h) Where an un-trafficked slab is likely to become trafficked within 20 years, it must be designed for "trafficked" criteria.
(i) Reserved.
(j) For slabs with W < 3.4 m one longitudinal edge must be a tied and corrugated joint.
(k) Slab width limits must make allowances for stress contributors such as mounted kerbs.
GENERAL
1. A definition of terms is contained in RMS R28 and RMS R33. Abbreviations and nomenclature are scheduled on sheet CC-02.
2. The design standards for use by both designers and constructors. Where design tables are included for (example, Table 2.2), it is stressed that they are intended purely for guidance and are not intended for interpretation and application by site staff. Project-specific drawings must therefore process design detail as specified in Table C12.
3. Jointed base must comply with the relevant drawings (CP 690) unless otherwise indicated.
4. All dimensions in millimetres (mm) unless otherwise shown.

PAVING
40. Paving of CRCP must proceed of adjacent jointed pavement unless separated by an isolation joint. Paving within traffic lanes must proceed paving within adjacent shoulder lanes. In the through-carriage way lane paving is permitted within traffic lanes except:
(a) where specially shown as an option in the planning details design tables in Table C12.
(b) Within 30 m of anchors, and/or;
(c) Within 30 m of contract limits.

See also Note 25.

REINFORCEMENT
41. All reinforcement design tables are based on an assumed interference friction coefficient of 0.5. Designers must cater for any variations to standard deconcreting treatments.

36. The number of "C" bars within each paved width must provide a minimum mass steel ratio within the range 0.67% to 0.72% when calculated as shown.

= Mass steel ratio (%) = (total sectional steel area) 

= (total concrete section area)

37. Number of "C" bars within any paved width = (Mass steel ratio) x (Concrete sectional area) + (Nominal cross-sectional area of N16 grade steel)

The calculated value of N must be rounded up to the next whole number to determine the minimum number of bars required and to ensure that the minimum steel ratio of 0.67% is obtained. The slab bar spacing must then be determined based on the minimum number of bars required and the clearance requirements to joints and edges.

38. See Fig 11.2 for bar marking legend.

39. Steel reinforcement must be in accordance with AS 4671, dowels and anchors must be as shown in the drawings.

40. Stirrup length need not be changed to suit specific cases.

41. The thickness of the top surface. Slab corners formed by joint Types C2, C7, C14, C15, or at free edges. The change from a tied longitudinal joint to an untied one (referred to as an "united charge") must only occur at joint Types C14 and C15.

KIRBS, ISLANDS, AND BARRIERS
42. Joints in kirbs (or LCS) are to be located in kirbs in the adjoining base according to Table R96 and must not be extruded. Such kirbs are deemed to satisfy the kerb continuity.

43. Anchor drains are only required where the longitudinal grade falls away from the anchor, delete the drain and extend the subbase to the anchor.

44. Anchor drains in kirbs abutting CRCP, construct shrinkage control joints in accordance with AS 2876 and at spacings of 2.5 m to 3.0 m.

45. The modification of kerbs abutting CRCP, refer to the relevant drawings (CP or CJ).

In joint Type C4 the sealant reservoir may be created by sawcutting the base concrete to a depth of 10 mm minimum and may be increased to 50 mm if required.

46. Designers' attention is drawn to the risk of using induced shrinkage cracking control joints (that is, excluding mounted kerbs such as types SF, SG, SM) the kerbs are deemed to satisfy the kerb continuity.

47. Geco-flexel wrapping is to be fully secured to prevent its intrusion into the base concrete.

48. The 200 mm depth minimum only is to be adjusted to suit grade and drainage requirements, as specified elsewhere in the relevant drawings.

49. No Fines Concrete in subgrade drain in accordance with RMS 3022.

50. Corroded drainage pipe in accordance with RMS 3552.

JOINT DETAILS
51. Transverse construction joints (Types P7) additional to those shown may be acceptable to suit the construction program and/or methods. They must be aligned at an angle to the longitudinal direction. The clearance distance can be reduced to 1.2 m and the angle 90° ± 10°. Unfilled joints Types C14 to C15 (inclusive) must be continuous between free ends. Where they are interrupted to achieve continuity.

52. All jointed bases in the base (including tied joints) must be bonded in accordance with the specification.

53. In corrugated joints, the top and bottom corrugations must be continuous in the base.

54. All corrugated joints in the base (including jointed base) must be bonded in accordance with the specification.

55. Slab with a full transverse joint in the base can be accommodated by sawcutting the base concrete to a depth of 10 mm minimum and may be increased to 50 mm if required.

56. A definition of terms is contained in RMS R82 and RMS R83. The imprint must be in accordance with CC-05 Detail Q, and to a depth of 5 mm minimum.

57. Impacts stamps should preferably be placed within low trafficked areas.

58. Anchors are to be in accordance with the specification.

59. A stamp is not required under proposed ACsurfacing.

60. All anchor construction joints, the horizontal faces must be trimmed.

61. Anchors may be constructed in discrete sections to match base pavement widths. Where used, vertical construction joints in anchor must be placed within 50 mm of a longitudinal Base joint.

62. All joints daylight at formed joints or edges, the sealant (both concrete and C15) must be filled to seal all leaks. The smeared bead must be at least 3 mm in diameter, and the imprint must be in accordance with CC-05 Detail Q, and to a depth of 5 mm minimum.

63. The location of Base joints relative to the extremities of islands and kerbs is critical. The dimensions so specified must be used as a control for the location of jointed anchor. Where a Base joint intersects the plane of an adjoining kerb (that is, excluding mounted kerbs such as types SF, SG, SM) the kerb may be allowed to extend beyond the kerb as shown in the drawings.

SEALANTS AND FILLERS
64. Jointed and base joint filling must be in accordance with the relevant drawings.

65. Sealants are to be applied in the base only to form a bonded joint. The sealant must be applied in accordance with the relevant drawings (CP or CJ).

66. No stapling or finishing against rotation during paving.

SLAB SHAPE REQUIREMENTS
67. Slab shape requirements are listed in Table 2.4. These are critical criteria for forming the layout of joints, and compliance must be strictly observed.

68. Reserved.

69. When jointed bases are to CRCP, a reduction in the typical slab length is recommended to minimise crack formation stresses at the C2p joint.

REFERENCES
60. These Drawings provide standard details for use by both designers and constructors. Project-specific drawings must therefore show precise design detail as specified in Table C12.

61. The change from a tied longitudinal joint to an untied one (referred to as an "united charge") must only occur at joint Types C14 and C15.

62. Joints in kirbs (or LCS) are to be located in kirbs in the adjoining base according to Table R96 and must not be extruded. Such kirbs are deemed to satisfy the kerb continuity.
TERMINAL DESIGN AT BRIDGES FOR ROAD SKEW $\geq 84^\circ$

NOTES (g) CP-04A

- Anchor 2 and 3 not shown. See also Table 5.1 and Note (g) CP-04A

- The shoulder shown in Figure 5.2 is PCP and this may be replaced by CRCP and the joint details shown in the main carriageway apply to the shoulder.

- The shoulder shown in Figure 5.2 is PCP and this may be replaced by CRCP and the joint details shown in the main carriageway apply to the shoulder.

- Apply slab widening at point 'C' to achieve the angle limit of 70° minimum.

- Locate the skewed Type F2 joints, they need not be parallel but angles $\Phi_1$, $\Phi_2$ and $\Phi_3$ should be approximately $90^\circ \pm 6^\circ$ and approximately equal. Check dimensions 'W1' to 'W4' with the target minimum value of $64^\circ$ minimum.

- Type C1 / C2 and F2 joints (at points 'D', 'E' and 'F') are specified to avoid reflective corner cracking.

- Locate the Type F72/F71 joint (marked 'A - B' on this diagram). Locate point 'A' according to dimensional limits.

- Check that the dimensional limit on the opposite side is satisfied.

- Locate the anchor relative to the approach slab at the closest side (top side in this diagram).

- For all other joint types shown in the main carriageway, refer to Table 11.1 and 11.2.

- The shoulder shown in Figure 5.2 is PCP and this may be replaced by CRCP and the joint details shown in the main carriageway apply to the shoulder.
CRCP TERMINAL ANCHOR 1 DESIGN AT BRIDGES

FOR ROAD SKEW \( \theta \leq 84^\circ \)

* DENOTES SEE FIGURE 11.2

SECTION 4
SCALE 1:50

CRCP TERMINAL ANCHOR 1 DESIGN AT BRIDGES FOR ROAD SKEW \( \theta < 84^\circ \)

DENOTES SEE FIGURE 11.2

SECTION 6
SCALE 1:50

CRCP TERMINAL ANCHOR 1 DESIGN AT BRIDGES FOR ROAD SKEW \( \theta \leq 84^\circ \)

DENOTES SEE FIGURE 11.2

SECTION 8
SCALE 1:50

CRCP TERMINAL ANCHOR 1 DESIGN AT FLEXIBLE PAVEMENT

DENOTES SEE FIGURE 11.2
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT (CRCP)

This sheet may be prepared using colour and may be incomplete if copied.
TABLE 10.1: UNTIED JOINTS - SILICONE SEALANT DIMENSIONS

<table>
<thead>
<tr>
<th>Joint Sealant</th>
<th>Slab Length L or Width W (mm)</th>
<th>Design Joint Opening (mm)</th>
<th>Seawall Width Wg (mm)</th>
<th>Seawall Depth Dg (mm)</th>
<th>Recover Rg (mm)</th>
<th>Joints and spacings</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS1</td>
<td>≥ 44</td>
<td>2.1</td>
<td>7 (+3, -0)</td>
<td>7 (+3, -0)</td>
<td>5 ± 3</td>
<td>8 ± 2</td>
</tr>
<tr>
<td>JS2</td>
<td>4.6 &lt; L ≤ 6.0</td>
<td>2.9</td>
<td>9 (+3, -0)</td>
<td>8 (+3, -0)</td>
<td>5 ± 3</td>
<td>8 ± 2</td>
</tr>
<tr>
<td>JS3</td>
<td>6.6 &lt; L ≤ 8.0</td>
<td>3.5</td>
<td>10 (+3, -0)</td>
<td>8 (+3, -0)</td>
<td>5 ± 3</td>
<td>8 ± 2</td>
</tr>
<tr>
<td>JS4</td>
<td>8.0 &lt; L ≤ 9.5</td>
<td>4.0</td>
<td>11 (+3, -0)</td>
<td>9 (+3, -0)</td>
<td>6 ± 3</td>
<td>8 ± 2</td>
</tr>
<tr>
<td>JS5</td>
<td>9.6 &lt; L ≤ 11.6</td>
<td>4.4</td>
<td>12 (+4, -0)</td>
<td>10 (+4, -0)</td>
<td>7 ± 3</td>
<td>10 ± 4</td>
</tr>
<tr>
<td>JS6</td>
<td>11.6 &lt; L ≤ 13.0</td>
<td>4.8</td>
<td>14 (+4, -0)</td>
<td>11 (+4, -0)</td>
<td>8 ± 4</td>
<td>10 ± 4</td>
</tr>
<tr>
<td>JS7</td>
<td>13.0 &lt; L ≤ 15.0</td>
<td>6.0</td>
<td>17 (+5, -0)</td>
<td>16 (+5, -0)</td>
<td>9 ± 3</td>
<td>12 ± 6</td>
</tr>
<tr>
<td>JS8</td>
<td>C14 and P14 at Bridge</td>
<td></td>
<td>25 ± 4</td>
<td>14 (+4, -0)</td>
<td>10 ± 4</td>
<td>12 ± 4</td>
</tr>
</tbody>
</table>

Table 10.2 Notes:
(a) Width and length are calculated as the mean dimension for the two slabs abutting the joint under design.
(b) Width and length are calculated as the mean dimension for the two slabs abutting the joint under design.
(c) Width and length are calculated as the mean dimension for the two slabs abutting the joint under design.
(d) Width and length are calculated as the mean dimension for the two slabs abutting the joint under design.

TABLE 10.2: JOINT CORRUGATION DESIGN

<table>
<thead>
<tr>
<th>TYPE S: FULL CORRUGATIONS</th>
<th>TYPE F: CORRUGATIONS LINKED BY FLATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE THICKNESS D (mm)</td>
<td>NUMBER OF CONCAVE CORRUGATIONS %</td>
</tr>
<tr>
<td></td>
<td>CORRUGATION DEPTH V (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 200</td>
<td>3</td>
</tr>
<tr>
<td>200 - 220</td>
<td>3 or 4</td>
</tr>
<tr>
<td>&gt; 230</td>
<td>6 ± 2</td>
</tr>
</tbody>
</table>

Table 10.2 Notes:
(a) Type S will typically suit slipform paving and type F will suit fixed-form paving.
(b) The top and bottom corrugations must be concave in the first-placed face (that is, convex on the form).
### TABLE 11.1: REINFORCEMENT SCHEDULE AND BAR SPACING

<table>
<thead>
<tr>
<th>MARK</th>
<th>DIA</th>
<th>SHAPE</th>
<th>LOCATION / DESCRIPTION</th>
<th>LENGTH (m)</th>
<th>SPACING (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>N12</td>
<td>1</td>
<td>CROP: Transverse bars</td>
<td>To suit slab width</td>
<td>See Table 12.1</td>
</tr>
<tr>
<td>A2</td>
<td>N12</td>
<td>1</td>
<td>Transverse bars above anchors</td>
<td>To suit slab width</td>
<td>350 c/c, 6 per anchor</td>
</tr>
<tr>
<td>B1</td>
<td>N16</td>
<td>1</td>
<td>CROP: Longitudinal bars - terminal ends</td>
<td>Variable</td>
<td>at C bar centres</td>
</tr>
<tr>
<td>B2</td>
<td>N16</td>
<td>1 or 23</td>
<td>CROP: Longitudinal bars in C6 joints</td>
<td>Variable</td>
<td>at C bar centres</td>
</tr>
<tr>
<td>C</td>
<td>N16</td>
<td>1</td>
<td>CROP: Transitions in slab width</td>
<td>12.0 m</td>
<td>One bar along transition edge</td>
</tr>
<tr>
<td>D1</td>
<td>N16</td>
<td>8</td>
<td>CROP: Anchor 1</td>
<td>2.0 m</td>
<td>at C bar centres</td>
</tr>
<tr>
<td>D2</td>
<td>N16</td>
<td>1</td>
<td>CROP: Anchors 2 and 3</td>
<td>2.0 m</td>
<td>at C bar centres</td>
</tr>
<tr>
<td>E1</td>
<td>N12</td>
<td>1</td>
<td>Tiebars in longitudinal joints E2 is acceptable in C1 joints</td>
<td>1.0</td>
<td>See jointing plan and Table 12.1</td>
</tr>
<tr>
<td>E2</td>
<td>N12</td>
<td>7</td>
<td>Tiebars in longitudinal joints alternative to E1 for joint C1</td>
<td>1.0</td>
<td>See jointing plan and Table 12.1</td>
</tr>
<tr>
<td>E3</td>
<td>N12</td>
<td>1</td>
<td>Tebars (clustered) in longitudinal joint C2p between CROP and PCP</td>
<td>1.0</td>
<td>See Note (d) and Figure 12.1 Use E6 or drilled</td>
</tr>
<tr>
<td>E4</td>
<td>N12</td>
<td>1 or 22</td>
<td>Drilled tiebars (drill-ties) in longitudinal joint C2d</td>
<td>0.75</td>
<td>See jointing plan and Table 12.1</td>
</tr>
<tr>
<td>E5</td>
<td>N12 or N16</td>
<td>1</td>
<td>Tebars in joints F22</td>
<td>1.0</td>
<td>See Table 11.5</td>
</tr>
<tr>
<td>F</td>
<td>N16</td>
<td>4</td>
<td>Anchor stirrup</td>
<td>-</td>
<td>CROP: at C bar centres Jointed: 300</td>
</tr>
<tr>
<td>G</td>
<td>N16</td>
<td>3</td>
<td>Anchor stirrup</td>
<td>-</td>
<td>CROP: at C bar centres Jointed: 300</td>
</tr>
<tr>
<td>H</td>
<td>N16</td>
<td>1</td>
<td>Anchor bars</td>
<td>To suit slab width See note 14</td>
<td>10 per anchor</td>
</tr>
<tr>
<td>J1</td>
<td>N12</td>
<td>21</td>
<td>Kerb types SA, SB, SO and SK longitudinal joints.</td>
<td>1.0</td>
<td>1 000 ± 50</td>
</tr>
<tr>
<td>J2</td>
<td>N12</td>
<td>1</td>
<td>Kerb types SE and SL longitudinal joints. See Note 6(a)</td>
<td>1.0</td>
<td>1 000 ± 50</td>
</tr>
<tr>
<td>J3</td>
<td>N12</td>
<td>5</td>
<td>Kerb types SF and SM</td>
<td>0.5</td>
<td>500 MAX; See note 35</td>
</tr>
<tr>
<td>J4</td>
<td>N12</td>
<td>1</td>
<td>Kerb types SA, SB, SE, SL, SO and SK longitudinal joints. Variable</td>
<td>500</td>
<td>See note 35</td>
</tr>
<tr>
<td>K</td>
<td>N20</td>
<td>6</td>
<td>Acute corners incl. SFCP-R terminal slabs</td>
<td>3.0</td>
<td>-</td>
</tr>
<tr>
<td>L1</td>
<td>N16</td>
<td>1</td>
<td>Additional C-N16 bars abutting joints C7 and C6</td>
<td>12.0 TYP and MIN</td>
<td>at 3 x C bar centres</td>
</tr>
<tr>
<td>M1</td>
<td>MESH</td>
<td>-</td>
<td>SL82, PCP-R general</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M2</td>
<td>MESH</td>
<td>-</td>
<td>Bridge approach anchor slabs. Varies with L1, See Table 11.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M3</td>
<td>MESH</td>
<td>-</td>
<td>Subgrade beams. SL92 or LSMT</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 11.1 Notes:
- (a) A2 bars need not be continuous across longitudinal joints.
- (b) L2 tiebars must be securely fixed against rotation during paving.
- (c) See Note 4(d) Sheet CC-03.
- (d) For E3 and E6 ties, calculate the number of ties required (Figure, 12.1) then locate them within the middle third of the PCP slab length.

### TABLE 11.2: BAR REINFORCEMENT SHAPES

<table>
<thead>
<tr>
<th>SHAPE</th>
<th>BAR MARK</th>
<th>MEASURE</th>
<th>VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 11.3: REINFORCEMENT NOTATION

**BAR**
- **MESH**
- **DOWELS**
- **FIBRE**

**SHAPES**
- **DEFORMED**
- **ROUND OR DEFORMED**

**STRENGTH**
- **500**
- **600**
- **700**

**DUCTILITY**
- **N**
- **L**

**NOTATION USED IN DRAWINGS**
- **N12, N16**
- **SL82, SL92, RL918 etc**

### TABLE 11.4: BAR REINFORCEMENT COVER

<table>
<thead>
<tr>
<th>Bar Mark</th>
<th>Measure</th>
<th>Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1, A2</td>
<td>Top</td>
<td>Tied under B1, B2, C, L1</td>
</tr>
<tr>
<td></td>
<td>Ends(2)</td>
<td>60 MN</td>
</tr>
<tr>
<td>B1, B2</td>
<td>Top</td>
<td>15 x 200: 100 ± 10</td>
</tr>
<tr>
<td></td>
<td>Ends(2)</td>
<td>60 MN, 120 MAX</td>
</tr>
<tr>
<td>D1, D2</td>
<td>Bottom</td>
<td>80 x 20</td>
</tr>
<tr>
<td></td>
<td>Ends(2)</td>
<td>110 x 30(4)</td>
</tr>
</tbody>
</table>

Table 11.4 Notes:
- (a) Sides and edges relate to longitudinal orientation.
- (b) An example of an "end" is where these bars are located alongside a transverse joint such as a C7, C14 or C15.
- (c) All dimensions are to intersections of straight portions at outside of bends.
- (d) Or as required to meet cover requirements under the sawcut.
- (e) Specialist design is required.

### FIGURE 11.1

**BRIDGE APPROACH PAVEMENT**

**FIGURE 11.2:** BAR MARKING LEGEND

**TABLE 11.5: TERMINAL SLAB SFCP-R AT BRIDGE APPROACHES; REINFORCEMENT AND TIEBARS**

- **TABLE 11.6: BAR COVER WEB**

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>E5 Tiebar spacing F72</th>
<th>Mesh M2 Upper limit on RED (cp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L(m)</td>
<td>(mm) N12(N16)((3))</td>
<td>Thickness of terminal slab (mm)((5))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thickness of terminal slab (mm)((5))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250</td>
</tr>
<tr>
<td>300</td>
<td>300 [550]</td>
<td>300 [550]</td>
</tr>
<tr>
<td>400</td>
<td>300 [550]</td>
<td>250 [400]</td>
</tr>
<tr>
<td>500</td>
<td>250 [450]</td>
<td>150 [350]</td>
</tr>
<tr>
<td>600</td>
<td>150 [450]</td>
<td>120 [180]</td>
</tr>
<tr>
<td>700</td>
<td>120 [350]</td>
<td>90 [120]</td>
</tr>
<tr>
<td>800</td>
<td>90 [120]</td>
<td>60 [150]</td>
</tr>
<tr>
<td>900</td>
<td>60 [120]</td>
<td>45 [90]</td>
</tr>
<tr>
<td>1000</td>
<td>45 [90]</td>
<td>30 [60]</td>
</tr>
</tbody>
</table>

Table 11.5 Notes:
- (a) See Sheets CC-05 and CC-06. Lp is measured at the longest edge.
- (b) Designers may nominate other bar option.
- (c) This is the safe upper limit for RED on the specific cell parameters.
- (d) For higher RED a mesh with increased transverse capacity is required.
- (e) Three sheets of mesh are required. The third sheet may be placed at top or bottom to suit construction logistics.
- (f) Thickness = concrete base + asphalt surfacing.
TABLE 12.1: SPACING OF A1 BARS AND TIEBARS E1 AND E2

<table>
<thead>
<tr>
<th>Relief-edge Distance (RED) (mm)</th>
<th>Tiebar spacing / A1 Bar spacing (mm)</th>
<th>Base Thickness (D) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3.1</td>
<td>1400 / 750 1400 / 750 1380 / 750 1280 / 750 1180 / 750 1090 / 750</td>
<td>180</td>
</tr>
<tr>
<td>3.1 - 3.5</td>
<td>1460 / 750 1385 / 750 1335 / 750 1300 / 750 1270 / 750 1200 / 750</td>
<td>200</td>
</tr>
<tr>
<td>3.6 - 4.0</td>
<td>1280 / 750 1150 / 750 1090 / 750 990 / 750 890 / 750 820 / 750</td>
<td>220</td>
</tr>
<tr>
<td>4.1 - 4.5</td>
<td>1120 / 750 1020 / 750 930 / 750 850 / 750 780 / 750 720 / 750</td>
<td>240</td>
</tr>
<tr>
<td>4.6 - 5.0</td>
<td>1020 / 750 920 / 750 840 / 750 770 / 750 710 / 750 660</td>
<td>260</td>
</tr>
<tr>
<td>5.1 - 5.5</td>
<td>930 / 750 840 / 750 760 / 750 700 / 750 640 / 750 600</td>
<td>280</td>
</tr>
<tr>
<td>5.6 - 6.0</td>
<td>860 / 750 770 / 750 700 640 590 550</td>
<td>300</td>
</tr>
<tr>
<td>6.1 - 6.5</td>
<td>790 / 750 710 640 590 540 510</td>
<td>320</td>
</tr>
<tr>
<td>6.6 - 7.0</td>
<td>730 660 600 550 510 470</td>
<td>340</td>
</tr>
<tr>
<td>7.1 - 7.5</td>
<td>690 610 560 510 470 440</td>
<td>360</td>
</tr>
<tr>
<td>7.6 - 8.0</td>
<td>640 570 520 480 440 410</td>
<td>380</td>
</tr>
<tr>
<td>8.1 - 9.0</td>
<td>590 / 750 590 / 750 560 520 480 440</td>
<td>400</td>
</tr>
<tr>
<td>9.1 - 10.0</td>
<td>520 / 750 520 / 750 480 440 410 400</td>
<td>420</td>
</tr>
<tr>
<td>10.1 - 1.0</td>
<td>490 / 750 490 / 750 450 410 380 340</td>
<td>440</td>
</tr>
<tr>
<td>11.1 - 1.2</td>
<td>470 / 750 470 / 750 430 390 350 310</td>
<td>460</td>
</tr>
<tr>
<td>12.1 - 1.3</td>
<td>450 / 750 450 / 750 410 370 330 290</td>
<td>480</td>
</tr>
<tr>
<td>13.1 - 1.4</td>
<td>430 / 750 430 / 750 390 350 310 270</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 12.1 Notes:
(a) TIEBAR spacings are maximised at 750 to meet support criteria for the longitudinal steel.
(b) Base Thickness = Concrete Base + asphalt surfacing. Spacing based on 12 mm deformed 500N steel, interlayer friction \( \mu = 1.5 \) and density of reinforced concrete = 2460 kg/m³
(c) Where only one number is provided, it applies to tiebars and to 'A1' bars.
(d) Relief-edge distance (RED) is measured from the joint (or section) under design to the nearest relief edge. The value for RED must make allowances for stress contributors such as connected kerbs and future widening. See also Figure 16.2.
(e) Designers may nominate alternative A1-N16 bars at spacings which are increased in proportion to the sections' area, that is 20/810=1.8

TABLE 12.2: LAP OPTIONS FOR B1, B2 AND C BARS

<table>
<thead>
<tr>
<th>Base depth (D) (mm)</th>
<th>Top cover (MT)</th>
<th>Bottom cover (MS)</th>
<th>Top cover (CT)</th>
<th>Bottom cover (TS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>60</td>
<td>80</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>200</td>
<td>60</td>
<td>90</td>
<td>70</td>
<td>90</td>
</tr>
<tr>
<td>220</td>
<td>70</td>
<td>100</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>240</td>
<td>90</td>
<td>110</td>
<td>80</td>
<td>110</td>
</tr>
<tr>
<td>260</td>
<td>100</td>
<td>120</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>280</td>
<td>110</td>
<td>130</td>
<td>100</td>
<td>120</td>
</tr>
</tbody>
</table>

Table 12.2 Note:
(a) Mesh M1 can be placed with longitudinal bars either above or below the transverse bars, unless the rotation is dictated by other factors such as lapping requirements.
(b) For base depth between values use next thicker base depth for mesh cover.

Figure 12.1: TIEBAR NUMBERS IN JOINT C2p AND IN PCP

- Average tiebar spacings are determined from Table 12.1 or from Drawing CP-07. (With reference to Table 12.1, note that specialist design is required for PCP where RED exceeds 8.0m.)
- The theoretical designs are indicated by the dashed lines. Design tolerances have been applied to derive the shaded zones hence no further tolerance is allowed. Where a value falls on a boundary line, the lesser value may apply. For example, Case 2 requires only 5 tiebars per slab.
- Actual tiebar spacings are then adjusted as follows:
  - In C2p joints: the tiebars must be clustered; see CD-08;
  - In Type P joints: adjust spacings in accordance with the Volume CP to achieve clearance from adjacent P8 joints.
- This figure applies also to PCP-R.

Figure 12.2.1: 12-BAR CYCLE

- The three patterns shown left are suggested common layouts.
- Alternative patterns may be used subject to the following conditions:
  - Laps lengths must be a minimum of 33 bar diameters, or 525 mm min for N16 bars;
  - Patterns must be specified (defined) in the approved project drawings;
  - The patterns must be consistent (that is, repeating) within any width as bounded by longitudinal joints;
  - Patterns may vary across longitudinal and transverse joints;
  - The layout must not result in more than one-third of laps falling within a test box as shown in Figure 12.2.4.

Figure 12.2.2: 5-BAR CYCLE

Figure 12.2.3: 3-BAR CYCLE

Figure 12.2.4: TEST BOX

The lap pattern is conforming.
FIGURE 15.1
EXTENSION OF EXISTING CRCP WITH NEW CRCP

SECTION 13
NOT TO SCALE

NOTES
(a) DETAILS OF EXISTING PAVEMENT ARE INDICATIVE ONLY AND SHOULD BE CHECKED AGAINST WORKS-AS-EXECUTED DRAWINGS.
(b) ANCHORS ARE NOT REQUIRED IN THE NEW WORK IF ANCHORS ARE CONFIRMED IN EXISTING CRCP.

SEE TABLE 2.4

SEE CC07 FOR ADDITIONAL REINFORCEMENT DETAILS

SAWCUT AND REMOVE EXISTING CRCP
FULL DEPTH AS NECESSARY TO REMOVE
ARRIS ROUNding OR OTHER DEFECTS

THICKNESS
TRANSITION
200 ± 20

REINFORCEMENT NOT SHOWN
FIGURE 15.2
EXTENSION OF EXISTING PCP WITH NEW CRCP

NEW CRCP CONSTRUCTION
NEW CRCP TRANSITION
LENGTH INFLUENCED BY GEOMETRIC CRITERIA

EXISTING PCP

NEW BASE D
NEW SUBBASE S

SLAB LENGTHS
3 700 TO 4 600 TYP

SLAB WIDTHS
UP TO 4 600 TYP

LANE WIDTHS
UP TO 3 700

SHOULDER WIDTHS
UP TO 3.0m TYP

JOINT SKEWS UP TO 1 : 6 (80°)

ANCHOR № 1
ANCHOR № 2
ANCHOR № 3

1-N16-12000 AT 3 x C BAR CENTRES

84° MIN
84° MIN
84° MIN
84° MIN

C7d
C7d
C7d
C7d

SEE TABLE 2.4

SEE CC-07 FOR ADDITIONAL REINFORCEMENT DETAILS

REINFORCEMENT NOT SHOWN

SECTION 14
NOT TO SCALE

THICKNESS TRANSITION
1100 - 200

15B

P1
P2
OR
P2

CRCP EXTENSION OF EXISTING PCP

PAVEMENT STANDARD DRAWINGS
RIGID PAVEMENT
STANDARD DETAILS - CONSTRUCTION
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT (CRCP)
CRCP EXTENSION OF EXISTING PCP
FIGURE 15.3
EXTENSION OF NEW PCP WITH NEW CRCP

SECTION
NOT TO SCALE

FIGURE 16.1

REINFORCEMENT DESIGN
(SEE FIGURE 16.2 FOR GUIDE TO RED)  
* NOTE (d)

FIGURE 16.2

EXAMPLES OF RELIEF - EDGE DISTANCE (RED)

NOTE (d)*

FIGURE 16.2 NOTES:
(a) LONGITUDINAL STEEL IS INDEPENDENT OF RED
(b) RED MUST INCLUDE THE INFLUENCE OF KERBS AND BARRIERS WHICH:
   (i) HAVE CROSS-SECTIONAL AREA OF 0.09 m² OR GREATER, AND
   (ii) ARE TIED TO, OR LOCATED ON TOP OF THE BASE.
(c) TRANSVERSE STEEL AND TIEBARS MUST BE NOT LESS THAN THAT
   REQUIRED FOR THE NEAREST RED AT THE POINT OF HIGHEST STRESS
   WITHIN THE SLAB (AS BOUNDED BY LONGITUDINAL JOINTS).
(d) SLAB AND KERB WIDTHS MARKED ‘*’ AND ALL LANE WIDTHS ARE INDICATIVE ONLY.

KEY:
RED ➔ SECTION UNDER DESIGN

(CRCP REINFORCEMENT AT TRANSITIONS IN WIDTH (SHOWN SEPARATED FOR CLARITY))

TYPICAL PLAN - WITH CRCP RAMP

igsaw versio 0.0.0.0