APPENDIX C ROAD DESIGN AND CONSTRUCTION

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Drwg R –2- 704  Typical Sections of Services

Electricity E
Gas G
Telephone T
Water W

PRIVATE WAYS
SCALE 1:50

a) NARROW FOOTPATH
(residential or industrial)

b) WIDE FOOTPATH

Electricity E
Gas G
Telephone T
Water W

BERM AND FOOTPATH

STREETS
SCALE 1:50

NOTE:
1) THIS IS MEANT AS A GUIDE ONLY AND ACTUAL LAYOUTS WILL DEPEND ON SERVICE AUTHORITY REQUIREMENTS AND AVAILABLE SPACE.

TYPICAL SECTIONS OF SERVICES

PLAN NO. R-2-704
ASSET CATEGORY: BERMS
APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R –9- 705 Standard Turning Areas for Residential Streets

CIRCULAR TURNING AREA

L TURNING AREA

T TURNING AREA

Y TURNING AREA

NOTE: USE TYPE 1 WHEREVER POSSIBLE

SCALE 1:250

STANDARD TURNING AREAS FOR RESIDENTIAL STREETS

PLAN NO. R-9-705

ASSET CATEGORY: CARRIAGeways

APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R –9- 706 Standard Turning Areas for Industrial Streets and Right-of-ways

INDUSTRIAL RIGHTS OF WAY (OR SERVICE LANE)
Scale 1:250

INDUSTRIAL STREET
Scale 1:500

STANDARD TURNING AREAS FOR INDUSTRIAL STREETS AND RIGHTS-OF-WAY

PLAN NO. R-9-706
ASSET CATEGORY: CARRIAGeways
APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R –9- 707 Standard Turning Areas for Private Ways

**Plan No.** R-9-707

**Asset Category:** CARRIAGEWAYS

**Approved By:** D. Singh

**Date:** 18 Oct. 2010
Drwg R –9- 708  Rural and Urban Roads Explanatory Cross-sections

NOTE: Variation in the boundary to boundary width will be required to accommodate minimum tree planting requirements.
Drwg R –12-785  Standard Culvert Marker

**Diagram Description:**
- **SECTION:**
  - Sleeve of white PVC pipe 50mm Ø
  - 50mm Wide Eng. Grade "SM" Bands - Green
  - Culvert ID in Green 30mm High Capital Letters Spacing = 10mm
- **ELEVATION:**
  - Galvanised Warratah firmly fixed into ground

**Table: Standard Culvert Marker**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan No.</td>
<td>R-12-785</td>
</tr>
<tr>
<td>Asset Category</td>
<td>Culverts</td>
</tr>
<tr>
<td>Approved By</td>
<td>D. Singh</td>
</tr>
<tr>
<td>Date</td>
<td>14 Dec. 2007</td>
</tr>
</tbody>
</table>

**Scale:** 1:10
**Drwg R –17-763 Concrete Steps**

**Notes:**
1. Vertical height between landings shall not exceed 2.5m. Landing length shall not be less than 900mm.
2. Where the foundation as shown is not solid ground concrete footings down to solid are required with additional reinforcing to suit.

**Concrete Steps**

<table>
<thead>
<tr>
<th>RISE</th>
<th>GOING</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>350 (Standard)</td>
</tr>
<tr>
<td>180</td>
<td>325</td>
</tr>
<tr>
<td>170</td>
<td>300</td>
</tr>
<tr>
<td>180 (Max.)</td>
<td>275 (Min.)</td>
</tr>
</tbody>
</table>

**Plan No.** R-17-763

**Asset Category:** Footpaths/Steps

**Approved By:** D. Singh

**Date:** 18 Oct. 2010
Drwg R –19-760  Standard Handrail

TOP OF 100x100 POST CHAMFERED TO SUIT TOP RAIL
HANDRAIL TO BE FIXED TO POST WITH 12 NAIL TO FRONT AND 2 NAIL TO BACK (2x3" NAILS AND 6x2" NAILS WHERE RAILS JOIN ON POSTS.) NAILS TO BE CHASED FLUSH INTO TIMBER

H4 TREATED 100x100 BOTTOM RAIL

H4 TREATED 100x100 TOP RAIL, TOP EDGES CHAMFERED 10mm

H5 TREATED 100x100 POST @ 1.3m CENTRES NOMINAL
29x29 MESH AS REQUIRED

H4 TREATED 100x60 CENTRE RAIL WHERE MESH NOT REQUIRED

PATH LEVEL

H5 TREATED 50 THICK BATTERBOARD

NOTE:
ALL POSTS TO BE VERTICAL

SCALE 1:10

<table>
<thead>
<tr>
<th>STANADARD HANDRAIL</th>
<th>PLAN NO. R-19-760</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>HAND RAILS/SAFETY FENCES</td>
</tr>
<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
</tr>
<tr>
<td>DATE:</td>
<td>15 FEB. 2008</td>
</tr>
</tbody>
</table>
Drwg R –22-700  Standard Kerbs and Channels

DETAIL A
STD. KERB AND CHANNEL
(* LOW PROFILE KERB)
(.Bus STOP KERB)
(<= WIDE TOP KERB)

DETAIL B
STD. MOUNTABLE KERB AND CHANNEL

DETAIL C
LOW PROFILE MOUNTABLE KERB AND CHANNEL
(NOTE: THE USE OF THIS KERB REQUIRES THE APPROVAL OF THE WCC ENGINEER)

DETAIL D
STD. MOUNTABLE KERB

DETAIL E
STD. CARRIAGeway DIShED CHANNEL

DETAIL F
STD. FOOTPATH DIShED CHANNEL

DETAIL G
STD. HALF-ROUND CHANNEL
AT PEDESTRIAN PATH

DETAIL H
STD. NIB

DETAIL I
STD. NIB KERB

SCALE 1:10

ABSOLUTELY
POSITIVELY
Wellington

STANDARD KERBS AND CHANNELS

PLAN NO. R-22-700

ASSET CATEGORY: KERBS AND CHANNELS

APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R –24-720  Vehicle Scraping Mitigation

VEHICLE SCRAPING MITIGATION

PLAN NO. R-24-720

ASSET CATEGORY: LIGHT DUTY KERB CROSSINGS

APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R-24-721  Kerb / Footpath / Berm Vehicle Crossing

**SAWCUTS**

<table>
<thead>
<tr>
<th>Swgnt</th>
<th>Crossing Only A</th>
<th>Replace Footpath B</th>
<th>Replace Channel C</th>
<th>Replace Channel and Footpath D</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**ISOMETRIC VIEW**

*Scale 1:50*

**SECTION A-A**

*Scale 1:20*

- Footpath (for berms refer to notes 4 & 5)
- Sawcut A
- Sawcut B
- Sawcut C
- Sawcut D
- 50mm lip
- AP40 basecourse compacted to achieve a Clegg Impact Value of 35 in carriageway and 25 elsewhere
- Mix 4 replaced
- *Mesh (965)"

**NOTES:**

1) WHERE KERB HEIGHT EXCEEDS 150mm REFER TO ENGINEER.
2) 20 MPa (50-120 slump) CONCRETE WITH LIGHTLY BROOMED FINISHED.
3) SOFT SUBSOILS TO BE UNDERCUT BY 200mm and FILLED WITH COMPACTED BASECOUSE.
4) CROSSING DETAIL SHOWN ALSO APPLY WHERE NO PUBLIC FOOTPATH EXISTS.
6) "*" REFERS TO HEAVY DUTY VEHICLE CROSSING.

**KERB / FOOTPATH / BERM VEHICLE CROSSING**

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>R-24-721</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>KERB CROSSINGS</td>
</tr>
<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
</tr>
<tr>
<td>DATE:</td>
<td>18 OCT. 2010</td>
</tr>
</tbody>
</table>
Drwg R – 24-722  Raised Channel Vehicle Crossing

**SAWCUTS**

<table>
<thead>
<tr>
<th>Sawcut</th>
<th>Crossing Only</th>
<th>Raise Footpath</th>
<th>Raise Channel</th>
<th>Raise Channel and Footpath</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>

**ISOMETRIC VIEW**

Scale 1:50

**SECTION A-A**

Scale 1:20

**NOTES:**

1) WHERE KERB HEIGHT EXCEEDS 150mm REFER TO ENGINEER.
2) 20 MPa (80 - 120 BLUMP) CONCRETE WITH LIGHTLY BROomed FINISHED.
3) SOFT SUBSOILS TO BE UNDERCUT BY 200mm AND FILLED WITH COMPACTED BASECOURSE.
4) CROSSING DETAILS SHOWN ALSO APPLY WHERE NO PUBLIC FOOTPATH EXISTS.
6) * REFERS TO HEAVY DUTY VEHICLE CROSSING.

**RAISED CHANNEL VEHICLE CROSSING**

**PLAN NO.** R-24-722

**ASSET CATEGORY:** KERB CROSSINGS

**APPROVED BY:** D. SINGH

**DATE:** 18 OCT. 2010
Drwg R-24-723  Lowered Footpath Vehicle Crossing

SAWCUTS

<table>
<thead>
<tr>
<th>Sawcut</th>
<th>Replace Footpath</th>
<th>Replace Channel</th>
<th>Replace Channel and Footpath</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td>✓</td>
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</tbody>
</table>

Maximum 4% (40mm / 1000mm) change in gradient

Break out sawcut

Footpath (for berms refer to note 4)

ISOMETRIC VIEW
Scale 1:50

SECTION A-A
Scale 1:20

NOTES:
1) WHERE KERB HEIGHT EXCEEDS 130mm REFER TO ENGINEER.
2) 20 MPa (60-120 BUMPS) CONCRETE WITH LIGHTLY BROOCHED FINISHED.
3) SOFT SUBSOILS TO BE UNDERCUT BY 200mm AND FILLED WITH COMPACTED BASECOURSE.
5) * REFERS TO HEAVY DUTY VEHICLE CROSSING.

LOWERED FOOTPATH VEHICLE CROSSING

PLAN NO.  R-24-723

ASSET CATEGORY: KERB CROSSINGS

APPROVED BY:  D. SINGH
DATE:  18 OCT. 2010
Drwg R – 24-727  Pedestrian Ramp with Tactile Pavers

**Notes:**

1. Tactile SURFACES WILL NORMALLY BE 60mm THICK CONCRETE TILE Laid ON A 60mm THICK 2:1 SANDMORING BED. ANY ALTERNATING MATERIALS SHALL BE APPROVED BY THE ENGINEER.
2. THE TACTILE PAVING SHOULD NOT BE STEPPED IN GROUPS SUITABLE AGREED BY THE ENGINEER.
3. KERB RAMP TO COMPLY TO AS 4184 DESIGN FOR ACCESS & MOBILITY BUSINESSES ASSOCIATED FACILITIES.
4. TACTILE SURFACE TO COMPLY WITH 2011 NSW PUB.
5. DIRECTIONAL INDICATORS WILL NORMALLY BE REQUIRED IN SHOPS AND COMMERCIAL AREAS WHERE THE FOOTPATH IS LOCATED AWAY FROM THE GRANDE CHANNEL.

**Plan No.** R-24-727

**Asset Category:** Light Duty Kerb Crossings

**Approved By:** D. Singh

**Date:** 18 Oct. 2010
Drwg R –39-749  Pavement Subsoil Drains

NOTE:
1. UNDER KERB SUBSOIL AND CARRIAGeway SUBSOIL DRAINS ARE NOT TO BE LAIEd IN THE SAME TRENCH.
2. STRIP DRAIN EQUIVALENT APPROVED BY THE ENGINEER MAY BE USED (REFER TO R-39-750).

DETAIL A
UNDERCHANNEL / CARRIAGeway SUBSOIL DRAINAGE
USING SOCKED SUBSOIL PIPE AND FILTER FABRIC
AP20 BASECOURSE, TOPSOIL OR SITE MATERIAL AS SPECIFIED.
BASECOURSE OVER DRAINAGE TO BE COMPACTED.

DETAIL B
TOE OF BATTER SUBSOIL DRAINAGE
USING SOCKED SUBSOIL PIPE AND FILTER FABRIC

DETAIL C
50mmØ SUBSOIL DRAINAGE UNDER
RECONSTRUCTED KERB AND CHANNEL
50mmØ SOCKED SUBSOIL DRAIN TO STORMWATER SYSTEM

SCALE 1:20

<table>
<thead>
<tr>
<th>PAVEMENT SUBSOIL DRAINS</th>
<th>PLAN NO.</th>
<th>R-39-749</th>
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<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>SUBSOIL DRAINS</td>
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<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
<td></td>
</tr>
<tr>
<td>DATE:</td>
<td>18 OCT. 2010</td>
<td></td>
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</tbody>
</table>
Drgw R –39-750 Strip Drains

Detail A
Strip Drain Adjacent to Ex. Kerb & Channel

Detail B
Strip Drain Under New Kerb & Channel

Scale 1:10

Strip Drain
Plan No.: R-39-750
Asset Category: Subsoil Drains
Approved By: D. Singh
Date: 14 Dec. 2007
Drwg R –41-740  Full Sump and Sections

**PLAN VIEW**
- STANDARD KERB AND CHANNEL
- SUMP GRATE
- STANDARD OVERFLOW KERB
- D12 BAR
- 225mmØ LEAD FROM HALF BOX SUMP AS REQUIRED
- 1 x D12 BAR
- 150mm
- 350mm
- MIN. 50mm BRICK
- PRECAST CONCRETE CLEANING EYE SLAB
- PRECAST CONCRETE BAFFLE SLAB
- COMPACTED BACKFILL
- CHANNEL INVERT
- STANDARD OVERFLOW KERB
- STANDARD OVERFLOW KERB
- LONG OVERFLOW KERB
- MIN. 225mmØ LEAD TO MANHOLE GRADE 1 in 100 MIN.
- STANDARD STREET SUMP

**SECTION Y-Y**

**SECTION X-X**

**FULL SUMP AND SECTIONS**

**PLAN NO.** R-41-740

**ASSET CATEGORY:** SUMPS AND LEADS

**APPROVED BY:** D. SINGH

**DATE:** 18 OCT. 2010
APPENDIX C ROAD DESIGN AND CONSTRUCTION

DECEMBER 2012

Drwg R –41-741 Half Box Extension and Sections

---

**HALF BOX EXTENSION AND SECTIONS**

**PLAN NO.** R-41-741

**ASSET CATEGORY:** SUMPS AND LEADS

**APPROVED BY:** D. SINGH

**DATE:** 18 OCT. 2010
Drwg R –41-742  Details of Top of Sump and Half Box

<table>
<thead>
<tr>
<th>DETAILS OF TOP OF SUMP AND HALF BOX</th>
<th>PLAN NO.</th>
<th>R-41-742</th>
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</thead>
<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>SUMPS AND LEADS</td>
<td></td>
</tr>
<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
<td></td>
</tr>
<tr>
<td>DATE:</td>
<td>18 OCT. 2010</td>
<td></td>
</tr>
</tbody>
</table>
Drwg R –41-743 Overflow Kerb and Street Sump Details

NOTE: ALL CONCRETE UNITS TO BE MADE WITH 20 MPa AT 28 DAYS STRENGTH CONCRETE.

OVERFLOW KERB AND STREET SUMP DETAILS

PLAN NO. R-41-743

ASSET CATEGORY: SUMPS AND LEADS

APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Drwg R –41-744  Standard Street Sump Grate Frame

**SUMP FRAME**

**SECTION S - S**

**SECTION R - R**

**SCALE 1:5**

<table>
<thead>
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<th>PLAN NO.</th>
<th>R-41-744</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>SUMPS AND LEADS</td>
</tr>
<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
</tr>
<tr>
<td>DATE:</td>
<td>14 DEC. 2007</td>
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$|$
Drwg R –41-745  Standard Grate (Medium Flow Capacity)

PLAN

SECTION W - W

SECTION V - V

STANDARD GRATE (MEDIUM FLOW CAPACITY)

PLAN NO. R-41-745

ASSET CATEGORY: SUMPS AND LEADS

APPROVED BY: D. SINGH

DATE: 18 OCT. 2010
Drwg R –41-746  Cycle Safe Grate (Low Flow Capacity)

NOTE:
LOW FLOW CAPACITY AT ENGINEER'S PERMISSION ONLY.

<table>
<thead>
<tr>
<th>CYCLE SAFE GRATE (LOW FLOW CAPACITY)</th>
<th>PLAN NO.</th>
<th>R-41-746</th>
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<tr>
<td>ASSET CATEGORY: DUMPS AND LEADS</td>
<td>APPROVED BY: D. SINGH</td>
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<tr>
<td>DATE: 14 DEC. 2007</td>
<td>SCALE 1:5</td>
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</table>
Drwg R –41-747  Standard Deflector Sump Top

Plan of Left Hand Vane and Deflector Sump (Exact Opposite for Right Hand Model)

Detail of Vane

Typical Cross Section A-A

Steel Vane Welded to Cover Plate

Steel Vane Welded or Bolted to Sump Grating

25mm Vanes, 40mm Proud
25mm Vane, 30mm Proud – Rounded Off

Deflector Sump Top (Left Hand Model)
Deflector Sump Top (Right Hand Model)

Plan

Sump Deflectors and Vanes

Scale 1:20

Standard Deflector Sump Top

Plan No. R-41-747

Asset Category: Sumps and Leads

Approved By: D. Singh
Date: 14 Dec. 2007
Drwg R –44-780  Standard Street Names, Numbers, and No Exit Signs

**STANDARD STREET NAME BLADE DESIGN**

**STANDARD STREET NUMBER SUPPLEMENTARY DESIGN**

**STANDARD NO EXIT SUPPLEMENTARY DESIGN**

**SCALE 1:10**

<table>
<thead>
<tr>
<th>STANDARD STREET NAMES, NUMBERS AND NO EXIT SIGNS</th>
<th>PLAN NO.</th>
<th>R-44-780</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSET CATEGORY: TRAFFIC AND PARKING SIGNS</td>
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<td></td>
</tr>
<tr>
<td>APPROVED BY: D. SINGH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE: 14 DEC. 2007</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drwg R –44-782  Traffic Sign Support System

NOTE:
SET IN 20MPa CONCRETE BASE.

---

TRAFFIC SIGN SUPPORT SYSTEM

PLAN NO.  R-44-782

ASSET CATEGORY:  TRAFFIC AND PARKING SIGNS

APPROVED BY:  D. SINGH
DATE:  14 DEC. 2007

SCALE 1:2.5
Drwg R –45-702  Standard Speed Hump Details

WATTS PROFILE

MODIFIED WATTS PROFILE

TYPICAL SECTION

STANDARD SPEED HUMP DETAILS

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>R-45-702</th>
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<tbody>
<tr>
<td>ASSET CATEGORY:</td>
<td>TRAFFIC ISLANDS AND HUMPS</td>
</tr>
<tr>
<td>APPROVED BY:</td>
<td>D. SINGH</td>
</tr>
<tr>
<td>DATE:</td>
<td>14 DEC. 2007</td>
</tr>
</tbody>
</table>
Drwg R –45-703 Central Islands, Kerb Extensions and Chicanes

Note: Drainage to be provided as required.

Note: These are example layouts only. Specific designs require WCC approval.

CENTRAL ISLANDS, KERB EXTENSIONS AND CHICANES

PLAN NO. R-45-703

ASSET CATEGORY: TRAFFIC ISLANDS AND HUMPS

APPROVED BY: D. SINGH
DATE: 18 OCT. 2010
Sealing Report

Road and Location ___________________________ Date __________________

Air Temperature Start __________ Finish __________ Surface Condition _______

Starting Time __________ Finishing Time __________

Weather __________________

Binder Type __________ AGO(%) __________ KERO(%) __________ Precoating: Yes/No

Additives __________ Chip Size __________ Source _______

Rolling Equipment __________________

Details of Samples __________________

<table>
<thead>
<tr>
<th>Tank No</th>
<th>Distance</th>
<th>Area</th>
<th>Tank Dip</th>
<th>Spray Rate</th>
<th>Binder at 15°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From</td>
<td>To</td>
<td>Width</td>
<td>Start</td>
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<td>Finish</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Start</td>
<td>Finish</td>
</tr>
</tbody>
</table>

Total Chips Used: __________________

Comments __________________
Benkelman Beam Test Record

Street and Location:_____________________________________________________

Date:__________ Test Load:_____________ Tested By:_____________________

Pavement Temperature/Tyre Pressure:_____________________________________

(Details of location of test points and general information about the street are to be noted on the basis of this form).

<table>
<thead>
<tr>
<th>Test Point</th>
<th>Lane</th>
<th>Distance from Kerb</th>
<th>Deflection Readings</th>
<th>Description of Test Point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intermediate</td>
<td></td>
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