

## 5 Categories of Defects

### 5.1 General

When a defect has been identified, the Operating Company is required to use the guidance outlined in this Trunk Road Inspection Manual and take account of applicable regulations and engineering judgement in deciding when remedial action will be necessary and to make recommendations on the type of work required. There are two categories of defect defined in this Trunk Road Inspection Manual, namely Category 1 and Category 2.

### 5.2 Classification of Category 1 Defects

Category 1 Defects require prompt attention because they represent an immediate or imminent risk of either one or more of the following:

- Injury to any party using or repairing the trunk road network
- Significant disruption to the normal flow of traffic through the trunk road network
- Significant deterioration of any specific part or infrastructure of the trunk road network
- Damage to a third party's property, livestock or equipment
- Damage to the environment
- Liable to leave Scottish Ministers in breach of one or more of their statutory duties
- Failure to effectively enforce the legality of an asset that has a mandatory or prohibitory function
- Failure of an asset to fulfil its intended function where such an asset protects the road user, maintenance personnel, environment, the trunk road network infrastructure, and/or facilitates the safe use of the trunk road network
- Offence to road users from graffiti that is obscene, blasphemous or otherwise offensive.

**Examples of the types of defects that may constitute a Category 1 Defect are given for each asset type in the appropriate sections of Chapter 6. However, this Trunk Road Inspection Manual is deemed not to contain an exhaustive compendium of defects and in the absence of a description of a defect, the Operating Company is required to make the classification from first principles.**

**The principles of a system of defect risk assessment for application to safety inspections is set out in Chapter 9 of *Well Maintained Highways – Code of Practice for Highway Maintenance*. Each Operating Company should provide clear guidance and training to employees in the conduct of safety inspections.**

### 5.3 Response to Category 1 Defects

Category 1 Defects are corrected or made safe in accordance with Schedule 7 Part 1 of the Transport Scotland Operating Company Contract.

Category 1 Defects are corrected or made safe at the time of inspection if reasonably practicable. In this context, making safe may constitute displaying warning notices/signs, coning off or fencing to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of inspection, repairs of a temporary or permanent nature are carried out as soon as possible and no later than:

- 06:00 on the day following identification of the Category 1 Defect on carriageways,
- within 24 hours of identification for all other Category 1 Defects.

Where a temporary repair has been carried out, the deferred permanent repair period for the following defect types shall be

- 28 days for carriageway surface,
- 56 days for bridge parapets,
- All other Category 1 Defects repaired permanently within the specific period referred to in Schedule 7 Part 1 of the Transport Scotland Operating Company Contract, or no later than 28 days after identification where no specific period is stated.

## 5.4 Classification of Category 2 Defects

### General

Category 2 Defects are those which, following a risk assessment, are deemed not to represent an immediate or imminent hazard or risk of short term structural deterioration. Category 2 Defects should be repaired within planned programmes of work. The Operating Company logs, groups together and prioritises the repair of Category 2 Defects and submits programmes and bids for repairs in accordance with the requirements of Schedule 4 Part 1 of the Transport Scotland Operating Company Contract.

### Disability Discrimination Act

In December 2006, a new duty took effect, requiring government departments and agencies to publish a Disability Equality Scheme outlining how they would implement Disability Discrimination Act (DDA) 2005 responsibilities through policy, guidance, planning and stewardship. As trunk road authority, Transport Scotland published the trunk road Disability Equality Scheme and Action Plan document 'Roads for All' in December 2006 (<http://www.transportscotland.gov.uk/road/maintenance-and-management/accessibility>).

The document focuses on the design, construction, operation and maintenance of the trunk road network and forms part of the wider Disability Equality Scheme for Transport Scotland and the Scottish Government. The Action Plan included a requirement to inspect the whole trunk road network, including bus stops, to identify the extent of all types of barrier to travel for all users of the trunk road network.

Transport Scotland is committed to developing a programme to address the removal of these barriers to accessibility on the trunk road network. This will be achieved via a combination of taking opportunities to address these barriers where possible in conjunction with operations and works contracts, and also through future stand-alone works.

## 6 Inspection Requirements

### 6.1 General

This Trunk Road Inspection Manual is intended to be of loose leaf construction to facilitate updates as required, and contains details of the inspection activities for each asset type, each in its own section and sub-divided as follows:

- A list of detailed inspection codes relating to an activity and a schedule of the inventory items to which they apply.
- A schedule of defect codes specific to the activity, the defect attribute, unit of measurement, and minimum and maximum values.
- Notes on specific individual defects (where applicable).
- An indicative list of Category 1 Defects requiring immediate action.
- A list of DDA Defects (where applicable).
- Where deemed appropriate, relevant photographs are also included.

The detailed inspection requirements for each asset type are outlined in the following sections. A summary of inspection frequencies is also provided in Appendix F.

**Examples of the types of defects that may constitute a Category 1 Defect are given for each asset type in the appropriate sections of Chapter 6. However, this Trunk Road Inspection Manual is deemed not to contain an exhaustive compendium of defects and in the absence of a description of a defect, the Operating Company is required to make the classification from first principles.**

**The principles of a system of defect risk assessment for application to safety inspections is set out in Chapter 9 of *Well Maintained Highways – Code of Practice for Highway Maintenance*. Each Operating Company should provide clear guidance and training to employees in the conduct of safety inspections.**





## Bituminous Carriageways

### Permitted Inventory Items

- Carriageway (CW)
- Crossovers (XO)
- Central Reserves (CR)
- Central Islands (CI)
- Hard Shoulders (HS)
- Lay-by (LB)

This section relates to minor repairs to bituminous carriageways. It does not relate to larger scale work needed to strengthen the carriageway or to work linked with structural maintenance, including surface dressing, which would normally be classed as, or linked to, structural maintenance activities.

Particular consideration should be given to defects, which may constitute an immediate danger to road users and to identify deficiencies compromising the reliability, quality, comfort and ease of use of the carriageway.

| Inspection Requirement | Detailed inspections of carriageways, crossovers, central islands and central reserves, hard shoulders and lay-by. |                                      |
|------------------------|--|--------------------------------------|
| Inspection Frequency   | MC   | Annual Detailed Inspection           |
|                        | MD   | 2 Yearly Central Reserve Inspection  |
|                        | MS   | Structural Pavement Condition Survey |

| Defect Description  | Code | Attribute | Units     | Min. | Max. |
|---|------|-----------|-----------|------|------|
| <b>Localised Cracking</b><br>Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities.           | LOCK | Area:     | sq metres | 1    | 250  |
| <b>Localised edge deterioration</b><br>Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities. | LODT | Length:   | metres    | 1    | 100  |
| <b>Surfacing joints</b><br>Open or excessive joints.  | SRJT | Length:   | metres    | 1    | 100  |
| <b>Cracking around ironwork</b>   | CKIR | Area:     | sq metres | 1    | 250  |
| <b>Patch – adjacent cracking</b>  | PACK | Area:     | sq metres | 1    | 250  |
| <b>Patch – loss of material (fretting)</b>  | PLMT | Area:     | sq metres | 1    | 250  |
| <b>Patch – difference in level</b><br>Difference in level of a patch with the surrounding carriageway.  | PDLV | Area:     | sq metres | 1    | 250  |
| <b>Trench RI – adjacent cracking</b><br>Cracking around a reinstated trench.  | TACK | Area:     | sq metres | 1    | 250  |
| <b>Trench RI – loss of material</b><br>Loss of material (fretting) from a reinstated trench.  | TLMT | Area:     | sq metres | 1    | 250  |
| <b>Trench RI – difference in level</b><br>Difference in level between a reinstated trench and the surrounding carriageway.                                | TDLV | Area:     | sq metres | 1    | 250  |
| <b>Pothole</b>  | POTH | Area:     | sq metres | 1    | 250  |
| <b>Single crack</b>   | CRCK | Length:   | metres    | 1    | 250  |
| <b>Patch – material cracking</b><br>Cracking of the material used for patching.   | PMCK | Area:     | sq metres | 1    | 250  |
| <b>Trench RI – material cracking</b><br>Cracking of the material used to reinstate the trench.  | TMCK | Area:     | sq metres | 1    | 250  |

|  |      |       |           |   |     |
|--|------|-------|-----------|---|-----|
| <b>Bituminous surfacing fretting</b><br>Loss of material from the carriageway surface. | BFRT | Area: | sq metres | 1 | 250 |
| <b>Flooding</b>  | FLOD | Area  | sq metres | 1 | 250 |
| <b>Debris in traffic lane</b>  | DBTL | Area  | sq metres | 1 | 250 |
| <b>Debris in hard shoulder</b>   | DBHS | Area  | sq metres | 1 | 250 |
| <b>Detritus</b>  | DETR | Area  | sq metres | 1 | 250 |
| <b>Other</b>   | OTHR |       |           |   |     |
| <b>None</b>  | NONE |       |           |   |     |

**Category 1 Defects include but shall not be limited to the following Defects:**

|            |   |
|------------|---|
| POTH       | Factors such as traffic speed, type and volume, road alignment and visibility, and the position of the pothole in the road relative to the normal track taken by vehicles shall be considered when categorising the Defect. Pothole $\geq$ 40mm and larger than 100mm x 100mm shall be categorised as Category 1 defects. Smaller or shallower potholes shall also be recorded as Category 1 defects where they pose a risk to road users .<br><br>Abrupt difference in level between the carriageway and any trench, repair or ironwork. |
| PDLV, TDLV | Road edge breaking and falling away (note: overrun of verge is not a Category 1 defect).  |
| LODT       | Sufficient amount of water lying on, or running along/across the carriageway which represents a hazard to road users, may interrupt the free flow of traffic, or cause damage to other Structures or the carriageway.   |
| FLOD       |   |
| DBTL, DBHS | Debris on the hardshoulder or carriageway that could damage a vehicle or cause road users to take avoiding action (note: immediate action should be taken to remove such debris).   |
| DETR       | Any severe accumulation of dirt, stone, gravel or other material in the hardshoulder or carriageway (note: immediate action should be taken to deal with oil spillages).  |





**SRJT** Surfacing Joints



**CKIR** Cracking around ironwork



**PACK** Patch adjacent cracking



**PLMT** Patch – loss of material



**PDLV** Patch – difference in level



**TACK** Trench RI – adjacent cracking



**TLMT** Trench RI - loss of material



**TDLV** Trench RI – difference in level



**POTH** Pothole



**DBHS** Debris in hard shoulder



**FLOD** Flooding





## Concrete Carriageways

### Permitted Inventory Items

- Carriageway (CW)
- Crossovers (XO)
- Central Reserves (CR)
- Central Islands (CI)
- Hard Shoulders (HS)
- Lay-by (LB)

This section relates to minor repairs to concrete carriageways. It does not relate to larger scale work needed to strengthen the carriageway or to work linked with structural maintenance, including surface dressing, which would normally be classed as, or linked to, structural maintenance activities.

Particular consideration should be given to defects, which may constitute an immediate danger to road users and to identify deficiencies compromising the reliability, quality, comfort and ease of use of the carriageway.

| Inspection Requirement | Detailed inspections of carriageways, crossovers, central islands and central reserves, hard shoulders and lay-by. |                                      |
|------------------------|--|--------------------------------------|
| Inspection Frequency   | MC   | Annual Detailed Inspection           |
|                        | MD   | 2 Yearly Central Reserve Inspection  |
|                        | MS   | Structural Pavement Condition Survey |

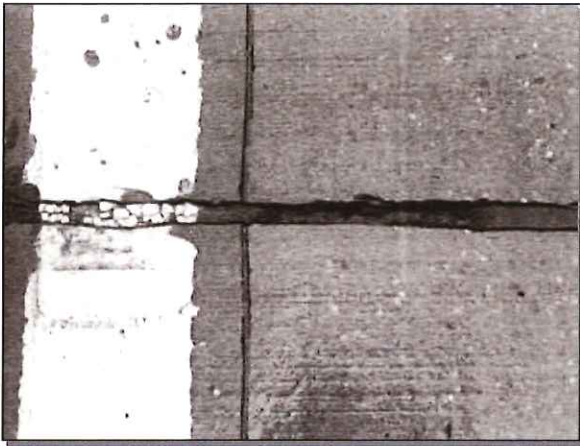
| Defect Description   | Code | Attribute | Units     | Min. | Max. |
|--|------|-----------|-----------|------|------|
| Joint seals  | JTSL | Length:   | metres    | 1    | 100  |
| Shallow spalling at joints / cracks  | SSPL | Length:   | metres    | 1    | 100  |
| Deep spalling at joints  | DSPL | Length:   | metres    | 1    | 100  |
| Opening of longitudinal joint  | OLJT | Length:   | metres    | 1    | 100  |
| Stepping at joint / crack  | STEP | Length:   | metres    | 1    | 100  |
| Vertical movement under traffic  | VMVT | Area:     | sq metres | 1    | 250  |
| Evidence of pumping  | EPMP | Area:     | sq metres | 1    | 250  |
| Settlement / ponding   | SETT | Area:     | sq metres | 1    | 250  |
| Cracking   | CRCK | Length:   | metres    | 1    | 100  |
| Failed overbanding / sealed cracks   | OVSD | Length:   | metres    | 1    | 100  |
| Surface crazing  | SRCZ | Area:     | sq metres | 1    | 250  |
| Scaling  | SCAL | Area:     | sq metres | 1    | 250  |
| Miscellaneous surface Defects  | MSRF | Area:     | sq metres | 1    | 250  |
| Surface texture worn   | SRTX | Area:     | sq metres | 1    | 250  |
| Initiate skid test   | SKID | Length:   | metres    | 1    | 100  |
| Failed repair  | RFAL | Area:     | sq metres | 1    | 250  |
| Patch – difference in level<br>Difference in level of a patch with the surrounding carriageway.  | PDLV | Area:     | sq metres | 1    | 250  |
| Trench RI – difference in level<br>Difference in level between a reinstated trench and the surrounding carriageway.                                | TDLV | Area:     | sq metres | 1    | 250  |
| Localised edge deterioration<br>Cracking confined to a discrete area of the carriageway and not associated with structural maintenance activities. | LODT | Length:   | metres    | 1    | 100  |
| Debris in traffic lane   | DBTL | Area      | sq metres | 1    | 250  |



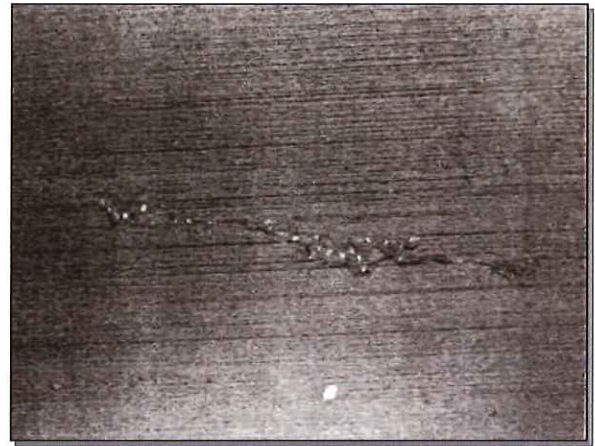
|                         |      |       |           |   |     |
|-------------------------|------|-------|-----------|---|-----|
| Debris in hard shoulder | DBHS | Area  | sq metres | 1 | 250 |
| Detritus                | DETR | Area  | sq metres | 1 | 250 |
| Flooding                | FLOD | Area: | sq metres | 1 | 250 |
| Other                   | OTHR |       |           |   |     |
| None                    | NONE |       |           |   |     |

**Category 1 Defects include but shall not be limited to the following Defects:**

|            |   |
|------------|---|
| SSPL, DSPL | Factors such as traffic speed, type and volume, road alignment and visibility, and the position of the spalling in the road must also be considered when categorising the Defect. Spalling in concrete $\geq 40\text{mm}$ deep and $> 100\text{mm} \times 100\text{mm}$ shall be categorised as Category 1 defects. Smaller/shallower spalling shall also be recorded as Category 1 defects where they pose a risk to road users. |
| PDLV, TDLV | Abrupt difference in level between the carriageway and any trench, repair or ironwork.  |
| LODT       | Road edge breaking and falling (note: overrun of verge is not a Category 1 defect).   |
| STEP       | Difference in level between adjacent concrete bays, either longitudinal or transverse.  |
| FLOD       | Sufficient amount of water lying on, or running along/across the carriageway which represents a hazard to road users, may interrupt the free flow of traffic, or cause damage to other Structures or the carriageway.   |
| DBTL, DBHS | Debris on the hardshoulder or carriageway that could damage a vehicle or cause road users to take avoiding action (note: immediate action should be taken to remove such debris).   |
| DETR       | Any severe accumulation of dirt, stone, gravel or other material in the hardshoulder or carriageway (note: immediate action should be taken to deal with oil spillages).  |



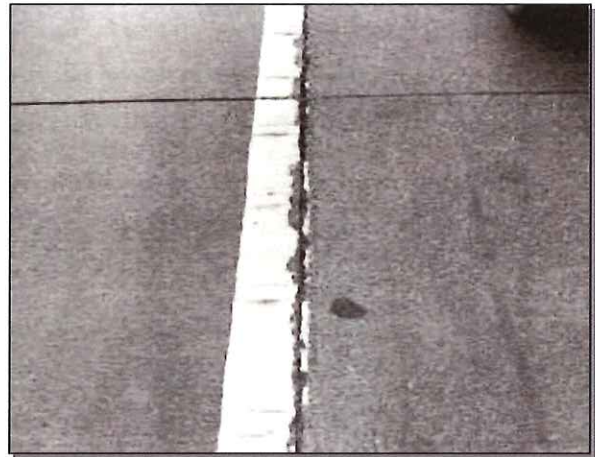
**JTSL** Joints seals



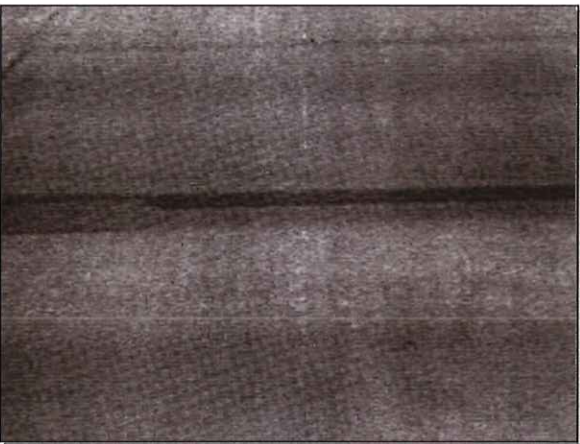
**SSPL** Shallow spalling at joints/cracks



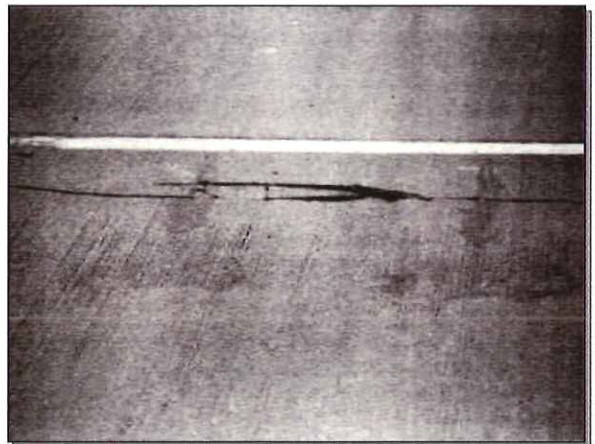
**DSPL** Deep spalling at joints



**OLJT** Opening of longitudinal joint



**STEP** Stepping at joint



**CRCK** Cracking





**OVSD** Failed overbanding / sealed cracks



**SRTX** Surface Texture Worn



**RFAL** Failed Repair



**OTHR**





## Pedestrian and Cycle Facilities

### Permitted Inventory Items

- Footway (FW)
- Cycle Facility (CT)
- Bus stop(BS)
- Miscellaneous street furniture

Footways include the walking surfaces of subways, structures and pedestrian rights of way which are under the responsibility of Transport Scotland and which may occasionally fall outside the road boundary. A cycle track is a paved facility available for persons with pedal cycles, with or without a right of way on foot, usually within the road boundary.

This section relates to minor repairs to footways and cycle tracks. It does not relate to larger scale work which would normally be classed as, or linked to, structural maintenance activities. Particular consideration should be given to defects, such as trips, which may constitute an immediate danger to pedestrians and/or cyclists.

| Inspection Requirement | Detailed inspections of pedestrian and cycle facilities |  |
|------------------------|---|--|
| Inspection Frequency   | FCA   | Monthly Detailed Inspection (Category A)   |
|                        | FCB   | 3 monthly Detailed Inspection (Category B) |
|                        | FC  | All other areas Annual Detailed Inspection |

| Defect Description  | Code | Attribute | Units     | Min. | Max. |
|---|------|-----------|-----------|------|------|
| Standing water  | STWT | Length:   | metres    | 1    | 100  |
| Slab profile – uneven/trips   | SLPF | Area:     | sq metres | 1    | 250  |
| Slab cracking   | SLCK | Area:     | sq metres | 1    | 250  |
| Slab rocking  | SROK | Area:     | sq metres | 1    | 250  |
| Block profile   | BKPF | Area:     | sq metres | 1    | 250  |
| Bituminous surfacing – potholes   | BPOT | Area::    | sq metres | 1    | 250  |
| Bituminous surfacing – local cracking<br>Cracking confined to a discrete area of the footway / cycle track.   | BLCK | Area:     | sq metres | 1    | 250  |
| Bituminous surfacing – extensive cracking<br>Cracking affecting the major part of a footway / cycle facility. | BECK | Area:     | sq metres | 1    | 250  |
| Bituminous surfacing – fretting<br>Loss of material from the footway / cycle facility surface.                | BFRT | Area:     | sq metres | 1    | 250  |
| Failed patch – adjacent cracking  | FPCK | Area:     | sq metres | 1    | 250  |
| Failed patch – loss of material<br>Loss of material (fretting) from an existing area of patching.             | FLMT | Area:     | sq metres | 1    | 250  |
| Failed patch – difference in level  | FDLV | Area:     | sq metres | 1    | 250  |
| Overgrown by vegetation   | OVGV | Length:   | metres    | 1    | 100  |
| Trench RI – adjacent cracking<br>Cracking around a reinstated trench.   | RACK | Area:     | sq metres | 1    | 250  |
| Trench RI – loss of material<br>Loss of material (fretting) from a reinstated trench.                         | RLMT | Area:     | sq metres | 1    | 250  |
| Trench RI – difference in level   | RDLV | Area:     | sq metres | 1    | 200  |
| Other   | OTHR |           |           |      |      |
| None  | NONE |           |           |      |      |