

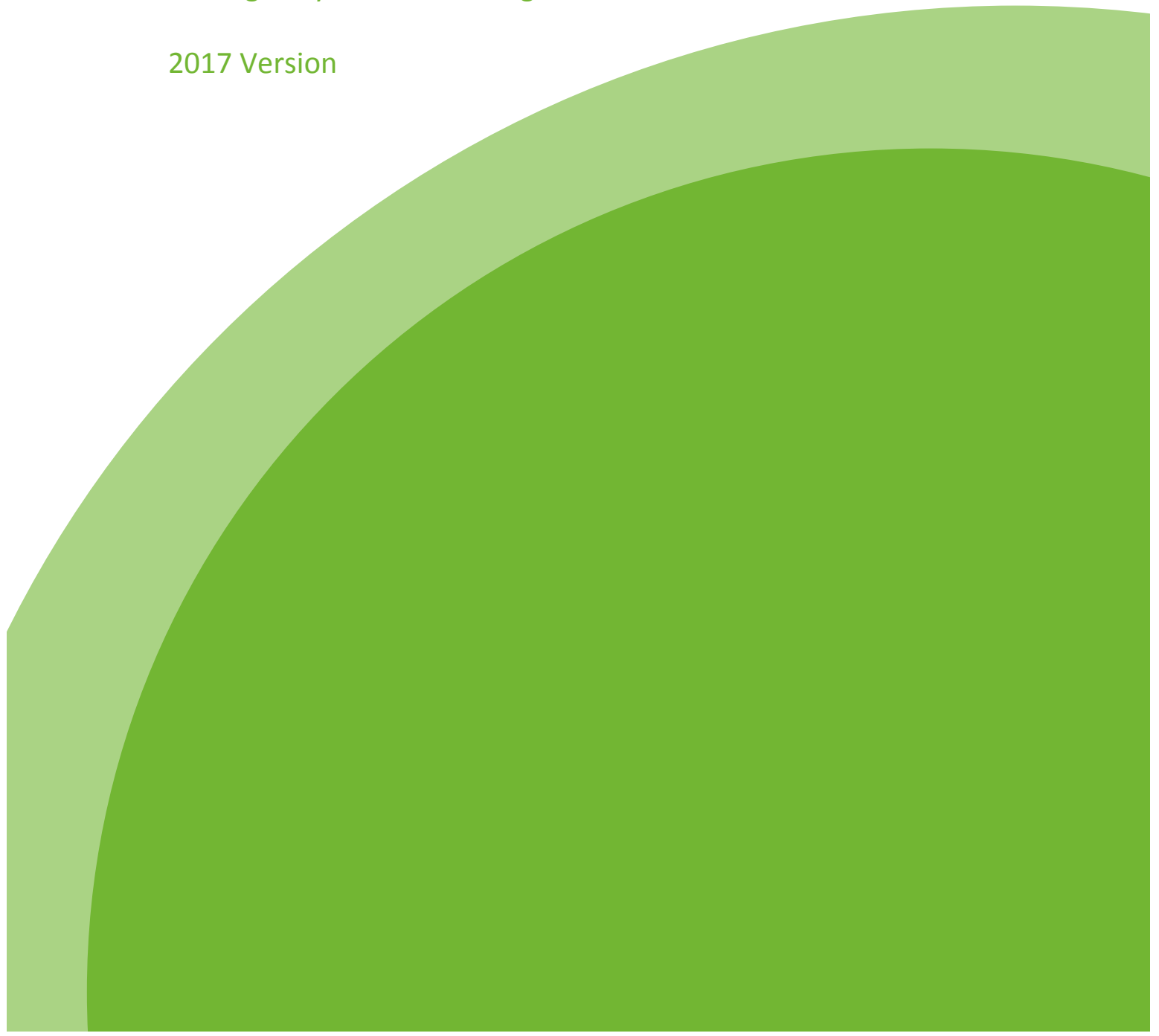


# Network Maintenance Management Plan

Annex A

Carriageways, Road Markings and Studs

2017 Version



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## A.1 Carriageway, Markings and Stud Maintenance

### Introduction

As detailed in the Highway Asset Management Plan, Central Bedfordshire Council manages over 1400 km of carriageway. This asset consists of Strategic Routes, Main and Secondary Distributor Roads, Link Roads and Local Access Roads, in both urban and rural environments.

The condition of the carriageway fabric contributes to objectives as follows:

Objective	Contribution
Safety & Serviceability	Nature, extent and location of surface defects
	Nature and extent of edge defects
	Nature and extent of surface skidding resistance
	Ride quality of the surface
Sustainability	Surface noise attenuation characteristics

When planning repair and renewal treatments, all users of the carriageway shall be considered, including cyclists, equestrians and other non-motorised users, as well as disabled and elderly users (where not mentioned in this plan, these users will be taken as those that need to be considered in all works).

## A.2 Carriageway, Markings and Studs Defect Categories

Defects on the carriageway are to be assessed with the reference to the Risk Matrix from the NMMP Core document 12.0 Defect Categorisation.

Nationally the definitions of defects continue to be tested through the courts. It should however be remembered that a test of dangerousness is one of reasonable foresight of harm to users of the highway, therefore, in considering the defectiveness of a carriageway surface defect, recognition must be given to where in the surface the defect is located. Consideration must be given in particular to cyclists and motor cyclists in that a lesser defect near the edge of a carriageway could be deemed dangerous by a Court.

When checking for defects, all users of the carriageway shall be considered, including cyclists, equestrians and other non-motorised users, as well as disabled and elderly users.

Where a promoted cycle route is defined on the carriageway the defect criteria will be as defined in annex B of this Network Maintenance Management Plan for the full width of carriageway.

Where defects with potentially serious consequences for network safety are made safe by means of temporary signing or repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the signing or repair is maintained, until a permanent repair can be made.

From NMMP Core Document 12.0 - Defect Categorisation

Degree of Deficiency	Timeframe for action
Category 0 Defects	Emergency make safe response in 2 hours
Category 1 Defects	These require prompt attention and will require a permanent repair to be made within 5 working days of the defect being assessed.
Category 2 Defects	All other defects. These will be prioritised and considered for repair within planned programmes of work.

### A.2.1 Definition of Carriageway Surface Defect at Investigatory level

Road surface defects – A hole in the bituminous surface with approximately vertical sides, where material has been lost, and where any surface dimension in two directions exceeds 150mm and depth exceeds 50mm. Missing or collapsed ironwork, sunken covers more than 50mm.

For any defect with utility apparatus assessed as Cat 0 or 1, the utility provider is to be notified immediately and requested to attend or make the defect safe. This shall be undertaken with reference and in accordance with Section 81 of the New Roads and Streetworks Act 1991. Where necessary CBC or its Service Provider will make safe the defect.

### A.2.2 Definition of Line Marking and Studs Defects at Investigatory level

Defect Category – Investigatory level
Stop, Give Way and Slow markings 50% worn or missing
Loose studs with consequent potential for damage and injury
3 or more adjacent studs in any line missing

Many road markings are used to give effect to regulatory provisions and it is important that their legal status is not affected by undue wear or damage. A high proportion of markings are essential for road safety or fundamental to the implementation of an integrated transport policy. If such markings are not kept in good order the measures may lose effectiveness and the success of transport integration compromised.

## A.3 Carriageway Inspections

The Inspection regime has three constituent parts:

Inspection type	Contribution
Highways Inspections	To comply with statutory obligations
	To meet the user's needs for safety
Area Team Inspections	To ensure availability
	To achieve integrity
	To maintain reliability
Carriageway technical Surveys [SCANNER and SCRIM]	To minimise cost over time
	To maximise value to the community
	To maximise environmental contribution

All information from the network inspection regime, together with any immediate or programmed action, including nil returns, shall be recorded. Such information shall, whenever systems are available be recorded in a GIS format so that it may be utilised together with other relevant information in the review of the maintenance strategy, practices and the development of works programmes. Accurate recording of inspection results is crucial for defending the authority against third party claims.

The Highway Inspection Regime shall be subject to annual review.

### A.3.1 Carriageway Highway Inspections

Highway inspections shall be undertaken to identify defects likely to create danger or serious inconvenience to users of the network or the wider community. The risk of danger is assessed on site and categorised so as to allow for an appropriate priority response.

Examples of defects on Carriageways
Surface Defects
Edge Defects
Surface skid resistance – visual assessment
Missing or loose covers
Dangerous utility apparatus, including covers
Missing or defective reflective road studs
Faded or missing road markings
Debris including mud

### A.3.2 Frequency of Highways Inspections for Carriageways

Category	Frequency
2	1 month
3a	6 weeks
3b	6 weeks
4a	3 months
4b	6 months

Driven inspections shall be undertaken by the passenger (with the driver's assistance) from a moving vehicle. In busy urban areas, it may be difficult to obtain the necessary level of accuracy from vehicle-based inspections and walking should be used. A lone inspector may undertake walked and cycled inspections. As found in the case of *Day v Suffolk County Council (2007)*, any inspection shall be carried out slowly enough for defects to be seen.

Where carriageway and footway hierarchies intersect, for example at defined crossing points at junctions, the more frequent inspection regime shall always take precedence in determining the inspection frequencies.

Consideration of classification of the road and therefore frequency of inspection should also occur on access routes to various features which will draw additional traffic; these features include but are not limited to:

- Access to schools, hospitals and medical centers;
- Vulnerable users or people with special needs; and
- Ceremonial routes and special events.

### A.3.3 Area team Inspections

Area team inspections should be strongly focused on ensuring that the network meets the needs of users and comprise more detailed specific inspections of particular highways elements, to ensure that they meet the levels of service defined in the Highways Asset Management Policy. These inspections may be undertaken in response to:

- Community concern
- As a result of incidents or extreme weather conditions
- In light of monitoring information, such as an abnormally high occurrence of damages claims
- If the particular characteristics make a carriageway more likely to deteriorate than other similar assets in the allocated category

Responding to these is a part of the risk management process.

All components across the various categories within the network hierarchy shall be maintained within the overall asset management strategy to ensure best value and optimal efficiency.

Operational efficiency is primarily a network management consideration but aspects are closely related to maintenance, for example:

- Traffic signs or markings may be missing, redundant, poorly sited or the legend may be either incorrect, confusing or not reflect current priorities;
- Facilities for walking, cycling or public transport may be discontinuous or poorly defined. Opportunities for installation of dropped kerbs or textured paving should be taken;
- Street lighting is poorly positioned.

Opportunities shall be taken to address integrity issues identified by the survey, for example:

- Replacing signs and re-lining;
- Installing dropped kerbs and texture paving;
- Modifying layouts.

Dependent upon the degree of deficiency, each identified defect shall be assessed for action through either:

- Routine works
- Programmed works

The nature of response for each element of the highway asset is established in the relevant asset section of this Plan.

For paint markings and for thermoplastic markings the Area Team inspection shall consider wear, spread, colour, skid resistance and retro-reflectivity. Inspections for reflective conspicuity may be conducted during the hours of darkness and programmed such that maintenance works can be completed before the onset of winter.

White line markings on strategic and main distributor roads and sites of high safety risk or with a relevant accident record should be renewed when they are no longer adequate for their intended purpose.

### **A.3.4 Carriageway Technical Surveys**

Surface Condition Assessment of the National Network or Roads (SCANNER) and Sideways-Force Coefficient Routine Investigation (SCRIM) are automated condition surveys. Specially adapted vehicles record longitudinal and transverse profile, rut depth, texture depth, gradient, cross fall and radius of curvature. In addition a SCANNER survey also records the extent of surface cracking. Full network coverage is achieved over a four year rolling survey period with Category 2 roads surveyed annually. SCANNER and SCRIM surveys are carried out by the Service Provider.

#### **A.3.4.1 SCANNER**

The data is used in the calculation of LTP indicators. The SCANNER outputs are also used extensively with other testing and surveys to determine areas of further investigation for inclusion in the structural maintenance programme.

SCANNER data shall also be used to determine the depreciated value of the network (DRC). Methodologies have been developed by CIPFA and endorsed by HM Treasury and are mandatory reporting requirements.

#### **A.3.4.2 SCRIM**

A Sideways-force Coefficient Routine Investigation Machine automatically measures wet road skidding resistance. This can then be compared to investigatory levels. It should be noted that there is no value at which a surface passes from being safe to unsafe; however some sites due to geometric or other constraints often require higher levels of skidding resistance to reduce accident risk. This data is a prime factor in determining maintenance requirements on the Classification 2, 3a and 3b Road Network.

SCRIM surveys will be carried out and assessed using advice contained within the Highways Agency Design Manual for Roads and Bridges and SCRIM Policy HD28/15.

Site category investigations will also be carried out as part of the SCRIM survey to determine investigatory levels.



The investigatory levels as set out in HD28/15 are as indicated in the following table:

Site Category and Definition		Investigatory level at 50km/h							
		0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65
B	Dual Carriageway non-event	Light	Dark	Dark	Light	Light	Light	Light	Light
C	Single Carriageway non-event		Light	Dark	Dark	Light	Light	Light	Light
Q	Approaches to and across minor and major junctions, approaches to roundabouts				Dark	Dark	Dark	Light	Light
K	Approaches to pedestrian crossings and other high risk situations					Dark	Dark	Light	Light
R	Roundabout				Dark	Dark	Light	Light	Light
G1	Gradient 5-10% longer than 50m				Dark	Dark	Light	Light	Light
G2	Gradient > 10% longer than 50m				Light	Dark	Dark	Light	Light
S1	Bend radius <500m – dual carriageway				Dark	Dark	Light	Light	Light
S2	Bend radius <500m – single carriageway				Light	Dark	Dark	Light	Light

Following structural condition surveys, dependent upon the degree of deficiency, each identified site shall be assessed for action through

The darker shaded areas in the table above will be the level for roads which carry significant traffic levels

The lighter shaded areas in the table above will be the level for low risk situations, where traffic flow is low or where risks have been mitigated.

The investigatory levels shall be reviewed on an annual basis along with the Skid Resistance Strategy produced as part of the HAMP.

Results of investigations should include whether further action is required and should be documented and retained.

Where skid resistance is considerably below investigatory levels, 'Slippery Road' signs should be erected as a matter of urgency. Following remedial action, and the maintenance engineer is satisfied that the issue has been rectified, the 'Slippery Road' signs should be removed as soon as possible.

### A.3.4.3 SCRIM and Scanner Frequencies

#### Carriageway SCRIM and Scanner Survey Frequencies

The frequency of inspection shall be:

Survey	Category	Frequency
SCANNER	2 Roads	Annually
	3a Roads	Annually
	3b Roads	Every 2 Years
Sideways-Force Coefficient Routine Investigation (SCRIM). To assess carriageway skid resistance.	2 Roads	Annually
	3a Roads	Every 4 Years
	3b Roads	Every 4 Years
	4a and 4b Roads	Where 3 or more wet skidding accidents have occurred in the previous 12 months

The SCRIM surveys are carried out at different seasons annually.

Early Season – April to end of May

Mid Season – June to end of July

Late Season – August to end September

2017 SCRIM carried out mid season.

### A.3.5 Keeping Carriageway Inspection records

Records should be kept of all inspections undertaken including nil returns and whether they have been inspected on foot as opposed to by vehicle. Such information shall be input on Insight/CAMS so that it may be utilised together with other relevant information in the review of the maintenance strategy, practices and the development of works programmes. Accurate recording of inspection results are crucial in assisting a defence against any third party claims.

## A.4 Carriageway Network Maintenance types

### A.4.1 Reactive and planned maintenance works

For all Carriageway defects, a risk based approach will be undertaken, preferably by an officer on site. Using the risk matrix in the NMMP Core, the defect will be allocated a category and an appropriate response.

#### A.4.1.1 Potholes

Category 0 and 1 defects (representing an immediate or imminent hazard) shall be permanently rectified as follows:

- Clean and cut back square or rectangular to a solid construction (saw cut to markings),
- Remove and brush out loose material and bond coat with cationic emulsion containing at least 60% bitumen giving particular attention to vertical faces.
- Lay matrix dominated asphalt and compact with the appropriate compacting equipment.

A cold lay material may be used as a temporary measure, provided that a permanent patch repair is undertaken as part of programmed routine works. Certain cold lay materials can also provide a permanent repair for type 3 and 4 roads.

#### A.4.1.2 Edge Damage

Category 0 and 1 defects (representing an immediate or imminent hazard) shall be rectified as follows:

- Clean and cut back to solid construction, square and backfill with hot matrix dominated bituminous material. For an un-kerbed carriageway, if necessary, full depth construction may be required.
- A cold lay material/type 1 may be used as a temporary measure, provided that a permanent patch repair is undertaken as part of programmed routine works. (Where defects with potentially serious consequences for network safety are made safe by means of temporary repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the repair is maintained, until a permanent repair can be made)

The duties of maintaining the public highway applies to the existing fabric of the highway, there is no duty to surface verges that are being over-run, this would

constitute improvement and not maintenance work (*see Alan Kind v Newcastle upon Tyne Council 2001*). Therefore, care shall be taken to ensure that the original edge of carriageway is reinstated and that there is no local widening of the carriageway in the area of reinstatement that abruptly terminates, or encourages vehicles to over-run the verge.

#### **A.4.1.3 Collapse**

- Traffic control measures shall be put into place to guide vehicular and pedestrian traffic safely around the collapse. This may be by the use of Stop/Go boards, temporary traffic signals or an emergency road closure. A physical barrier shall be erected around the hazard. The means of permanent repair shall then be assessed.

#### **A.4.1.4 Kerb Defects**

Category 0 and 1 defects (representing an immediate or imminent hazard) shall be rectified as follows:

- Re-set kerbs or replace missing kerbing with fast setting mortar or similar. Reinstatement both carriageway and behind with appropriate permanent materials
- A cold lay material may be used as a temporary measure, provided that a permanent repair is undertaken as part of programmed routine works. (Where defects with potentially serious consequences for network safety are made safe by means of temporary repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the repair is maintained, until a permanent repair can be made.) Certain cold lay materials can also provide a permanent repair

#### **A.4.1.5 Inspection Covers (and other Statutory Undertakers apparatus)**

Category 0 and 1 defects (representing an immediate or imminent hazard) shall be rectified as follows:

- Traffic control measures may be put into place to guide traffic or pedestrians safely around the defect. This may be by the use of traffic signals or an emergency road closure. A physical barrier may be erected around the hazard.
- If the apparatus is the responsibility of a statutory undertaker, the defect shall be referred to the utility company by the Streetworks Team. The defect will be monitored to ensure it does not deteriorate and change category.
- If the apparatus is the responsibility of the Highway Authority then a permanent repair shall be made in line with the risk matrix.

For permanent repairs, reset/replace cover using fast setting mortar or similar. Reinststate carriageway with appropriate materials, preferably hot matrix dominated asphalt.

For temporary repairs, a cold lay material may be used as a temporary measure, provided that a permanent repair is undertaken as part of programmed routine works. (Where defects with potentially serious consequences for network safety are made safe by means of temporary repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the repair is maintained, until a permanent repair can be made.) Certain cold lay materials can also provide a permanent repair

#### **A.4.1.6 Marking and studs**

Category 0 and 1 defects (representing an immediate or imminent hazard)

- ‘No Road Marking’ signage may be placed at the site. The re-marking of ineffective road and cycleway markings or studs shall then be enacted as soon as practicable. The long-term reinstatement requirements will then be assessed for inclusion within future routine works.

Category 2 defects (of a non-hazardous nature) shall be collated and be assessed for inclusion within future planned works.

#### **A.4.1.7 Mud and other deposits**

Many construction and agricultural activities can result in mud or other deposits being brought on to the highway. Such deposits can only be tolerated provided that they do not present an immediate danger to users of the highway. Those who have caused the deposit must also demonstrate reasonable process is in place to manage the risks they may cause. This may include warning signage or wheel washes.

Category 0 and 1 defects (representing an immediate or imminent hazard) shall be rectified as follows:

- The deposit shall be assessed and appropriate remedial action taken to make safe. Under Section 149 of the Highways Act 1980 the Council, as the Highway Authority, may recover any expenses reasonably incurred from the person by whom it was deposited.

For deposits that do not represent an immediate hazard to users of the highway, an approach to those causing the deposition will be made, insisting that they comply with Section 149 of the Highways Act 1980. If reasonable measures are not

undertaken to rectify the situation, then the deposition shall be removed by the Highway Authority as soon as reasonably practicable and any expenses reasonably incurred will be recovered.

#### **A.4.2 Programmed Maintenance**

In the design of a scheme the implications for maintenance is one of the most important factors considered. The use of standard details is one of the ways that we insure uniformity across the network as this reduces construction and maintenance costs.

Area	Description
Safety	The work should be carried out considering the safety of all users of the public highway. Consideration should be given to pedestrians, cyclists, and horse riders etc., not just the vehicular road user. Although safety is covered as part of a safety audit, other maintenance factors such as street lighting should also be considered as part of the safety considerations of the maintenance audit.
Serviceability	Are the works fit for its proposed purpose? All maintenance and improvement works shall be easily accessed by the user of the public highway i.e. There is little point in installing a sign that will be readily obscured by overhanging vegetation.
Sustainability	Are the maintenance/improvement works necessary and will these works be easily maintained in the future. There must be an emphasis on reusing/recycling materials

This also has safety benefits in designing out long-term risk.

The results of all inspections are to be communicated for integration into the maintenance programme. If the identified maintenance items are not contained in the 4 year programme, then the rectification costs shall be included in the improvement scheme budget.

## Appendix 1: Version Control

Version	Author	Checked	Approved	Comment
16th Nov 2017	C Nicol	J.Cross		Revised draft for Committee

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