



## **Milton Keynes Code of Practice for Street Lighting Maintenance**


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2017/2018

The master copy of this document is held by MKC Highways electronically, a signed copy is held by the Highways Client Service Manager.

A copy is also held by MKC Street Lighting Engineer and Ringways Street Lighting Manager.

#### Version Control

<b>Title</b>	<b>Code of Practice for Street Lighting Maintenance</b>
<b>Version Number</b>	3.2
<b>Document Status</b>	Final
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<b>Date</b>	May 2017
<b>Date of Next Review</b>	April 2018

Amendment No.	Date	Section	Page No.	Issue No.	Signature of Issue

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## CODE OF PRACTICE FOR STREET LIGHTING MAINTENANCE

### Introduction

Milton Keynes Council as Highway Authority is not required in law to provide street lighting, however, under the Highways Act 1980, Section 97 –

*1.) "... every local highway authority may provide lighting for the purposes of any highway or proposed highway for which they are or will be the highway authority, and may for that purpose -*

*a.) contract with any persons for the supply of gas, electricity or other means of lighting;"*

Highway Authorities have a duty of care to the road user. This duty of care does not imply any duty on the Highway Authority to keep the public lighting lit. However, an authority responsible for the maintenance of public lighting should be able to demonstrate that they have systems in place to maintain the public lighting equipment in a safe condition, including the detection of dangerous equipment.

This Code of Practice has therefore been developed with the primary aim of providing assistance to those officers involved in management of the Street Lighting service in MK and to give operational guidance to the 'Term' maintenance contractor undertaking the delivery of this service that they may carry out their duties with consistency and to clear recognised and understood criteria.

This code has been developed by a working group of officers who are directly involved at varying levels of responsibility in the function of Street Lighting related maintenance.

This code gives due regard to the Council's duties and has taken reference from other good codes of practice and appropriate legislation. The code will be itemised on the agenda for team meetings for the purpose of continual review and improvement.

Milton Keynes Council's code is primarily based on the "UK Roads Liaison Group Well Managed Highways Infrastructure (2004 – updated October 2016).

The code sets out risk based management and operational processes that are considered to be appropriate and reasonable, taking into account the safety of highway users, the specific considerations in Milton Keynes and the constraints placed upon the Council to manage public funds responsibly within defined budgets.

## Partnership Delivery

Milton Keynes Council has undertaken a procurement exercise to engage an external partner to deliver its contractual Street Lighting operational functions, including Street Lighting maintenance.

As part of the tender process a comprehensive contract document was produced which outlines specifications for all aspects of street lighting. However in the short time since letting the contract technology and energy costs have determined that a revision of the street lighting specification needed to take place in order to maximise the benefits of this technology and innovation. As a result this Code of Practice has been produced to reflect these changes.

The current appointed contractor is Ringway Infrastructure Services (RIS) Ltd. Ringway will adhere to this Code of Practice for Street Lighting maintenance with regard to its principles and guidelines, they will also apply their quality assurance management of this process in accordance with their own work flows in order that the repair process will be maintained.

Reference to either Ringway manuals and or work flows may be made within this document, they are not included but will be available on request.

## Milton Keynes Code of Practice

Ringway will be provided with this document and any in year amendments (recorded on page 3 of this document) that take place to ensure that the most current version is being used for inspections. This document will form the basis of Street Lighting maintenance for Milton Keynes.

## Team Meetings

Regular team meetings between Milton Keynes Officers and Ringway staff are held to discuss budgets, priorities, workload, software issues and problems within the service area. New Street Lighting staff will be expected to attend and eventually participate in these meetings, both to update themselves with new procedures and to involve themselves in any new methodology/processes.

## Code of Practice Reviews

An annual review of Milton Keynes Council Code of Practice for Street Lighting maintenance is held each year, both to provide Milton Keynes Council officers and Ringway staff with an opportunity to discuss any developmental needs and problems, and for the Highways Client Service Manager to review any issues related to work, performance and hierarchy definitions. This will also enable a review of the Key Performance Indicators attached to this stream of the service.

## Key Performance Indicators (KPI)

The new partnership arrangement attaches a number of Key Performance Indicators to the Street Lighting and maintenance performance of Ringway. Failure to attain the targets set can have an impact on the duration of the contract, it also provides for a pain/gain mechanism which will have a financial impact on non-performance.

The current associated KPI's are:-

KPI 1 – Response Times – Street Lighting

- Emergency works completed on time
- 28 Day works completed on time
- Street Lighting & Structural Inspections

KPI 2 – Remedial Works – Response Times

KPI 3 – Customer Satisfaction

KPI 55 – Percentage of Street Lights Working (excluding Grid Road Network)

KPI 55a – Percentage of Street Lights Working on the Grid Road Network

KPI 56 – Percentage of Street Lights Repaired in 5 Days

KPI 57 – DNO Repairs

KPI 59 – Customer Enquiries

These are reviewed annually and during the review process it may be necessary to reset targets and/or set additional KPI's to further monitor performance.

Details of KPI's are contained in **Appendix C**.

## Resources and Budgets

To deliver on its 'duty of care' to users of the highway, the Council provides financial resources. This allows operations to be carried out in both a planned and reactive manner in maintaining its public lighting in a safe condition. Each year the Council determines the allocation of its financial resources with due consideration to its strategic aims and priorities. The Street Lighting maintenance budget is one area of

allocation, which is split into a number of service delivery areas. Each with its dedicated budgets. An allocation of budget is specifically set aside for undertaking urgent repairs. In addition to this, funds are also available to undertake 7 and 28 day defect repairs, which might pose a potential hazard to users within the allocated priority timescale.

## Strategy

The authorities strategic aim is laid down in the Highways Asset Management Strategy (HAMS). This document supplements and provides further detail. All the elements of a public lighting system require inspection and maintenance to ensure that they are safe, operate correctly, continue to provide the designed performance, are sustainable and maximise their whole life cost. Maintenance can be divided into the following:

1. Annual Structural and Electrical testing of Street Lighting column asset – the entire asset is inspected every 6 years i.e. 1/6<sup>th</sup> of the asset or approximately 5,000 units are inspected each year. This produces two outcomes:
  - a. Unsafe columns are dealt with immediately
  - b. Inspection records inform capital programmes (in line with the Asset Management Strategy) based on priority thus reducing risk by targeting capital resource on an informed engineering basis.
2. Planned Capital Investment as part of the Transport Infrastructure Investment based on Structural and Electrical testing to upgrade columns and also convert existing lanterns to LED and SMART technology which has the effect of:
  - a. Reducing energy costs
  - b. Reducing maintenance costs / self reporting technology
  - c. Reducing Carbon outputs
  - d. Improve lighting outputs for highway users
  - e. Improve asset management lifecycle planning
  - f. Reduce risk of column failure
  - g. Rationalise existing variations in asset stock
  - h. Programme lighting levels to suit specific demands
3. Planned Capital Investment from external funding such as a Salix/Carbon Reduction and DfT Challenge Funds. A bid to convert all lit bollards to reflective or LED and convert existing lit signs to LED (funded from carbon reduction), this project will start in 2015 and be concluded in 2017, this will:
  - a. Reduce energy costs
  - b. Reduce maintenance costs
  - c. Reduce carbon outputs
  - d. Improve asset management lifecycle planning
  - e. Maintain safety



- f. Rationalise existing variations in asset stock to improve future maintenance management
4. Night time Scouting of High Speed Grid Roads, Redways Central Milton Keynes and Underpasses on a pre-set basis where faults are recorded, prioritised and entered onto the Highways Management System (Confirm). Flexibility has been built in to this provision so that ad hoc scouting can also take place.
5. Receipt of public service requests via the authorities customer care system which record details to be populated into the Highways Management System (Confirm) for action in accordance with priorities in this document.
6. Provision of a 24 hour emergency lighting service.
7. Emergency repairs are carried out within 2/24 hours on defects categorised in the defect matrix found in Table 1, 2, 3 and 4 and defined in Appendix B.
8. Reactive planned maintenance programmed to be undertaken within 7 or 28 days in accordance with the priority assigned to a reported defect in accordance with the defect matrix found in Table 1, 2, 3 and 4 and defined in Appendix B.
9. Planned upgrades of Control pillars and the private cable network, which have not been upgraded since original installations. This work will take place during the capital upgrade programme and will be in accordance with new specifications, this will support the overall strategy for capital column replacements.

This strategy supports a long term approach to standardising and improving the overall asset, minimising risk of asset failures by renewing assets based on a lifecycle approach and reducing the reactive nature of maintenance repairs to ensure a positive balance is restored with 75% spend on capital renewal and 25% on reactive repairs. This also has the added benefits of reducing energy and maintenance costs.

The long term strategy also encompasses the approach of embracing new technology in the form of SMART modules that can be fitted to LED Lanterns to enable 'real time' monitoring of lantern faults that are then automatically reported into the Highways Management system (Confirm) and eliminating the need for 3<sup>rd</sup> party reporting. This also has the potential benefit of additional energy savings by reducing consumption through selective dimming.

This technology is in the developmental stage and trials are currently taking place (2017). During which the 'SMART' technology will be tested to ensure cost benefits are realistic and that the system is suitable to be used on lighting assets and the outputs are part of the longer term network strategies with regards to management.

## Street Lighting Provision

Milton Keynes are currently improving their network by converting existing asset stock to LED on the Grid Road network, Redways, Industrial Estates and Residential Estates/Towns and we will continue this programme onto the rest of the existing network in line with its capital programme linked to 'Prudential Borrowing' investment.

The general appearance of the street scene shall be improved by moving away from monochromatic lighting (High Pressure Sodium and Low Pressure Sodium) and implementing light sources which will provide good colour rendition i.e. LED (presenting colours as they should appear). It is widely accepted that a road illuminated by white light sources such as LED is generally perceived as brighter and safer than that lit by HPS lamps. Some studies have also indicated that white light sources can almost double drivers peripheral vision and increase drivers brake reaction.

Specific designs and units will be detailed based on standards being met for design guidance. Road lighting designs will be completed by a competent lighting designer and be in accordance with BS5489 2012 and BSEN13201 2014

For the purposes of determining what lighting level should be provided at a particular location or on a particular length of highway Milton Keynes is divided into six different categories. These are listed below with a brief indication of the approach to lighting provision in each case. The actual lighting levels will be determined by the risk based analysis outlined in BS5489 and BSEN13201:

### **Grid Roads**

All 'H' and 'V' roads designated on the Grid. These roads are all lit except 2 sections where road safety without lighting can be demonstrated. Columns are 10 and 12m units. Mix of LED and SON lighting.

### **Estate Roads (Rural and Urban)**

All roads in both general rural (older towns) and urban (grid squares). These roads are generally all lit. Mixture of 5 and 6m columns. Mainly SON and SOX lighting.

### **Industrial Estates**

All commercial areas within grid squares only. 8 and 10m columns. Mix of LED and SON lighting.

### **Rural Roads**

All roads in general rural areas within the countryside, These roads are generally not lit except where road safety is an issue.

### **Redways (incl. Underpasses)**

All cycleways known as 'Redways' within the designated area, including all underpasses acting as links to estates. Generally all lit to MK specification. Mix of 5 and 6m columns and LED and SON lighting.

## **Central Milton Keynes**

All Boulevards/Gates/Parking Areas and Underpass links within the Central Milton Keynes designated area. All lit to MK specifications. Mix of 5, 6, 8 and 10m columns. Mix of LED and SON lighting.

## **Motorways and Trunk Roads**

These roads are maintained by Highways England (Area 8). The Agency's policy with regards to the lighting of these roads is separate from that of Milton Keynes Council.

## **Street Lighting Design**

All street lighting design will be carried out in accordance with current national design standards. Particular consideration shall be given to the specification matrices in Appendix A and Milton Keynes specific considerations in Appendix C of this document. In addition further detailed specification can be found in section 4.1 of the Highways, Streetlighting and Network Management term contract documents.

## **Adoptions**

Under Sections 278 and 38 of the Highways Act 1980 private developers may carry out works on the highway or create new highway which is to be adopted by the Highway Authority. Lighting and signs will normally be provided by developers on new housing developments. All scheme designs for these not designed by Milton Keynes Council must be approved by the Authority before installation commences. Milton Keynes Council adoption team will issue a Developers Information Pack to any proposed developer and liaise with developers/installers of lighting equipment prior to any alterations to existing equipment or additional equipment being installed to ensure that appropriate standards are followed. The cost of checking and approving scheme designs shall be borne by the developer. Regarding any equipment upgraded or installed as part of the development after initial approval full details shall be provided to Milton Keynes Council by the developer including test certificates etc. Any equipment which has less than 2 years left on the existing test certificates shall be re-tested and lamp faulty lantern replaced with LED Lantern exchanged (excluding LED lanterns) prior to adoption and the cost borne by the developer.

The maintenance and energy costs of the installed street lighting remain the responsibility of the developer until the roads are adopted and become part of the highway network.

***The necessary NICEIC certificates and as-installed drawings in agreed electronic format must be completed and forwarded to Milton Keynes Council Asset Manager before the legal completion of the adoption process.***

All developers shall attach one 'Not Adopted' sign to all lamp columns and lit signs that are erected as part of the development. These should be attached using non-metallic cable ties and will remain in place until such time as Milton Keynes Council adopts the equipment. The signs will provide the contact details of the developer or other relevant person to be contacted regarding any lighting defect. For larger developments, it is preferred that an information sign is erected at each entrance to the site advising residents of accurate contact details for all maintenance purposes. The style and format of these signs shall be

agreed with Head of Highways and Transport (or approved delegate) for Milton Keynes Council prior to installation.

Milton Keynes Council has a design and installation service which is available to developers on a rechargeable basis (contact the adoptions design team on 01908 254561).

## Asset Inspections

To reduce the risk to the public from falling debris or items of highway electrical equipment, regular visual inspection of all items of highway electrical equipment are carried out as a structural inspection.

A visual inspection of the structural condition of the column or sign post is carried out at each cyclic maintenance visit. In addition to this there is a programme of hammer testing where appropriate along with a condition survey to provide TR22 data.

Each time a lighting column is removed from service the opportunity is taken to inspect and analyse its condition and this information can be used to help develop further inspection and testing programmes. This condition data is used to develop future maintenance programmes.

Additional non-destructive testing, such as ultra-sonic testing or dynamic testing may be used to ensure the structural integrity of lighting columns and sign posts vested in the Council. This testing may be arranged to verify the condition of columns following a visual inspection where there are concerns or where an additional attachment may be needed.

## Street Lighting Scouting

To undertake its scouting inspections, Ringway has incorporated this activity within its existing team of Electricians on a rota basis who are specially trained for this activity. The Electricians are supported by Ringways Street Lighting Manager to provide advice and supervision. The MKHighways Street Lighting Engineer is also available for guidance and to implement changes to the code of practice.

Asset Location	Scouting Frequency
Grid Roads	Monthly
Redways	3 Monthly
Underpasses	3 Monthly
CMK	6 Monthly
All Other locations	Ad-Hoc as necessary

Milton Keynes Council will be installing a CMS system which will lead to self-reporting of faults at which stage the scouting operations will be reviewed.

## Training

All Ringway Operatives are trained in accordance with their own manual of competence training

## Road Traffic Collisions (RTC's)

Street lighting columns damaged in road traffic collisions that require removal and complete replacement are generally replaced with standard equipment. The replacement may be different from the rest of the columns in the road and could be, for example:

- A different light source
- A 6.0m column rather than a 5.0m column (typically the standard mounting height currently used on residential roads in Milton Keynes).
- A steel column rather than concrete or cast iron
- replaced in a different location, for example moved from the kerb edge to the back of footway
- Attached signage removed and reinstated or replaced dependent upon regulations or Traffic Regulation Orders

## Categorising Fault Priorities

Actionable repairs identified either during scouting inspections and / or service requests from the public received via Highways Maintenance Management System (Confirm) and fall into four categories (see Table 1 – Appendix B) and each fault will be assessed and given a category in accordance with the 'Risk Matrices for each fault type (see Tables 2, 3, and 4 – Appendix B)

The categories directly relate to the degree of hazard presented by a fault in consideration with the fault type and location.

This is defined in more detail in Prioritisation of Faults - Appendix B - Intervention Levels.

## Highways Maintenance Management System (CONFIRM)

Management of faults shall be via the Highways Maintenance Management System (Confirm), this database shall keep a permanent record of all routine and capital street lighting works carried out on the network. All lighting is managed at an asset level.

## Assets/Inventory/Records

All Street Lighting metadata shall be retained on Milton Keynes Councils Highways Maintenance Management computerised database (Confirm) and updated as necessary. As per requirement in Section 4.1 – App. 14/1 – Cl. 12 of the Contract Data for the Highways. Streetlighting and Network Management and relevant sections within this document.

Asset information shall be imported into the same system in the prescribed format within 2 weeks of completion of the works.

From the information entered on to Confirm a unique charge code is created for each

electrical asset, for example ;

45/345/678/nmx/999/99 (UNSUG code)

This number is unique to all electrical assets and shall be used as part of the energy submission utilising the SmartAsset functionality within Confirm.

The inventory is also used to identify future capital replacement schemes, energy saving schemes, dimming, electrical & structural testing programmes therefore all the relevant fields need regularly checked and updating.

The Asset Management register include:

- street lighting
- illuminated and non-illuminated traffic signs
- illuminated traffic bollards
- feeder pillars
- highway power supplies including feeder pillars, cables, joints & other components
- electrical connections on lighting columns for festive decorations
- Interactive speed signs or School safety signs
- speed cameras

Milton Keynes Street lighting energy consumption is managed via a half hourly metering and data collection system.

The switching information is recorded on a PECU array, this is a device which has 30 proportionately allocated photo-cells (according to our inventory) installed on it. Our meter administrator dials into the unit to collect the information, with this information the monthly figures are submitted to our energy provider to generate our energy invoice.

An energy submission is sent through to the distributor each month and invoices raised accordingly.

It is therefore essential that the system is updated regularly to ensure MKC is charged the right amount based on what equipment is actually installed.

Audits are carried out by the electrical distributor to check equipment on the highway and relevant penalties will be given if we are incorrectly declaring our usage.

## Competent Persons

Only competent persons will be allowed to work on street lighting installations and all contractors must be registered as follows:

- a. Engineering Council Recommendation – G.39.
- b. NICEIC (or similar).
- c. Approved Quality Assurance Systems.

## Test Certificates/Drawings

As per BS 7671 test certificates for all new works and minor work.

On completion of an electrical installation (street lighting, bollards, signs, etc) the following documents must be completed and forwarded to MKC Asset Manager within 2 weeks of the completion of the installation. The requirements are as follows:

- a. NICEIC Test Certificate.
- b. A laminated A4 cable schematic for placement in each feeder pillar.
- c. As-installed drawings including grid references – format tba

## Seasonal Decorations

The ILE's Code of Practice for the Installation, Operation and Removal of Seasonal Decorations shall be used for guidance.

No banner or catenary wire shall be permitted to be erected between two street lighting columns. Seasonal decorations must not hinder the normal maintenance of the highway structure concerned. Power supplies to seasonal decorations should not be derived from adjacent buildings, but from within the street lighting column acting as the support. (This is to avoid instances of connection to private supplies, over which the Highway Authority has no control). The body responsible for the installation/connection of the decorative lighting shall, separately, contract with an electricity supply company for the supply of energy and payment thereof.

Promoters shall use Milton Keynes Council 'Application Pack' for Seasonal Decorations which gives detailed guidance for Promoters on how to make an application in accordance to obtain a Section 178 licence for consent to install their equipment in the public highway. This application form is available on the Milton Keynes Council website: <http://www.tba>

## Smart Devices

Smart technology is currently evolving as a solution to traditional monitoring data collectors such as traffic centers, signal controllers, weather stations, pollution monitoring etc. The medium being utilised both to power and mount these devices is naturally lighting columns.

Any such devices must go through a technical approval process to ensure that the lighting asset is neither compromised or the safety of the public is put at risk. All installations shall be required to submit full diagrams and mounting details to the Service Manager for approvals.

All installations shall be carried out by MKC provider.

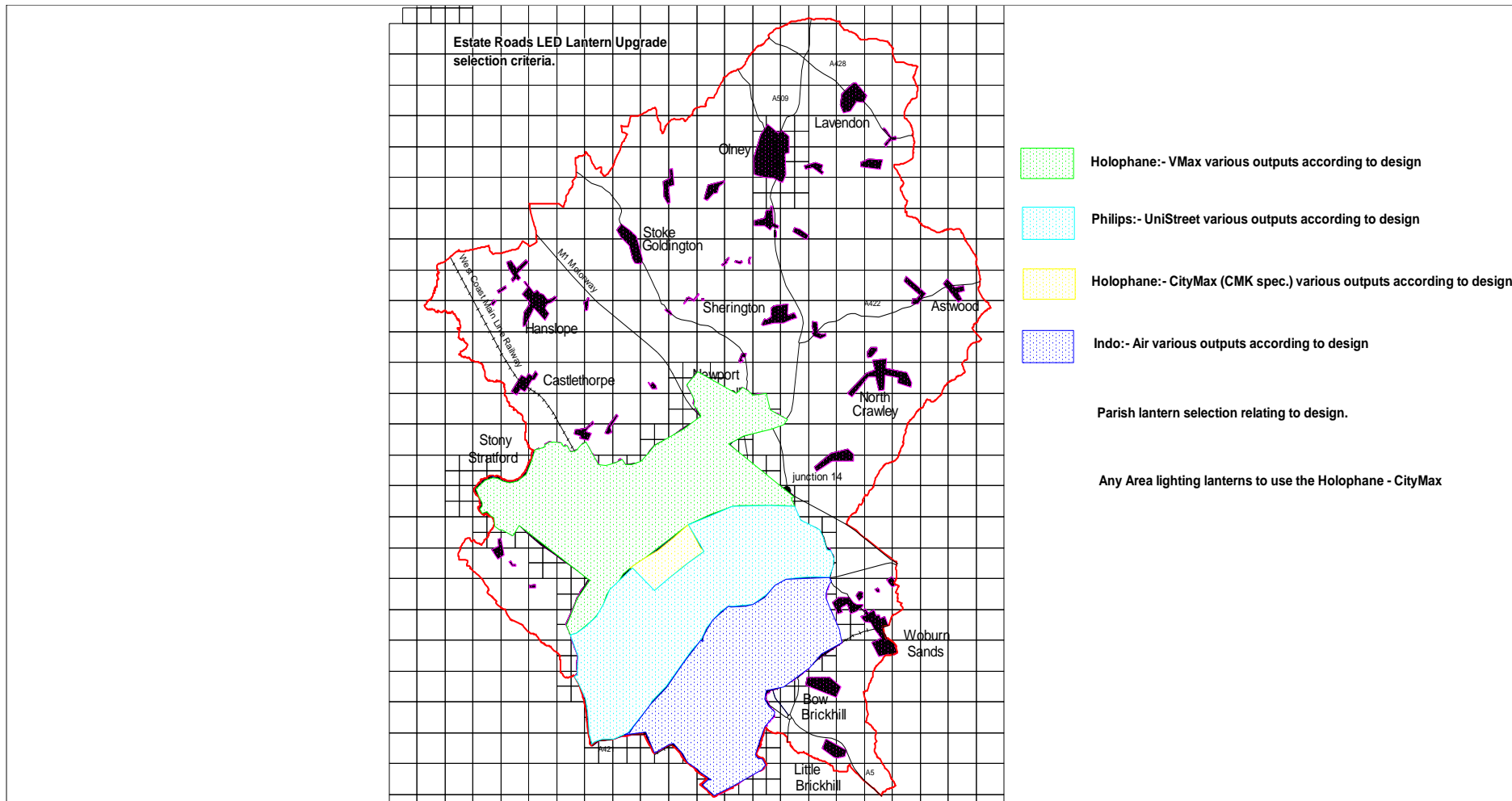
## Appendix A - Specification Selection Matrices



Column Type	Octagona I 12 metre / 1 metre bracket	Conical 12 metre / 1 metre bracket	Octagona I 10 metre / 1 metre bracket	Conical 10 metre / 1 metre bracket	Tubular 5 metre S/E (Brown)
<b>Road Classification</b>					
Grid Road Roundabout – Dual C/W		X			
Grid Road Straight section – Dual C/W	X				
Grid Road Roundabout – Single C/W				X	
Grid Road Straight section – Single C/W			X		
Classified Roads – Rural	X		X		
Redways - All					X

Lantern Type	URBIS Ampera 129w	Holophane Vmax	URBIS Ampera 92w	Holophane Vmax	Holophane – Facor small/ Urbis - Axia
<b>Road Classification</b>					
Grid Road Roundabout – Dual C/W		X			
Grid Road Straight section – Dual C/W	X				
Grid Road Roundabout – Single C/W				X	
Grid Road Straight section – Single C/W			X		
Classified Roads – Rural	X		X		
Redways - All					X
<b>Column Type</b>	<b>ROSA 8 metre / 1 metre bracket</b>	.	.	.	.
<b>Road Classification</b>					
Industrial Estate	X				

Column Type	ROSA 8 metre / 1 metre bracket	Tubular 5 metre S/E (Grey)	Tubular 5 metre P/T (Grey)	Tubular 6 metre S/E (Grey)	Tubular 6 metre P/T (Grey).
<b>Road Classification</b>					
Industrial Estate	X				
<b>Estate Roads</b>					
Primary				X	X
Non Primary		X	X		
Lantern Type	Holophane – Factor 74w LED	Holophane Vmax or agreed equivalent LED Lantern (as per map)			
<b>Road Classification</b>					
Industrial Estate	X				
<b>Estate Roads</b>					
Primary		X			
Non Primary		X			



Bollard Type	- Merlin Shell various types (white body) / 6w LED Ground lite Base	Signature - Trueflex shell various types (black body)	Signature - Solar Trueflex shell
<b>Road Classification</b>			
Grid Road Roundabout	X		X *
Grid Road Straight section	X		X *
All Roads - Non Grid Road Over 40mph	X		X *
All Roads - 40mph & below		X	

Sign Type	1200mm signs – various types	Simmons – LED Floodlight – LUA Signlight system various sizes	INDO Led Lamps 5 Swatt
<b>Road Classification</b>			
Grid Road Roundabout	X	X	
Grid Road Straight section	X	X	
All Roads – Non Grid Road Over 40mph	X	X	
All Roads – 40mph & below		X	

. \* **No Power Service** – If unable to provide permanent power supply or if economically unviable to do so.

## Appendix B - Reactive Fault Priority Matrices

**TABLE 1**

Key	Timescale for Fault Repair
<p>Planned Works</p> <p><b>See Table 2,3, &amp; 4 – Appendix B for Matrix</b></p>	<p>All Electrical Assets :</p> <p>Faults identified as planned in accordance with the respective matrix table, it may be necessary to carry out an assessment prior to assigning into the planned category.</p> <p>Once identified as planned works these faults will be stored in the system and repairs will be carried out as and when revenue budgets allow.</p>
<p>28-day (28 days shall be defined as 28 calendar days)</p> <p><b>See Table 2, 3 &amp; 4 – Appendix B for Matrix</b></p>	<p>All Electrical Assets :</p> <p>A fault that should be included in the 28 day works programme for repair.</p>
<p>7 – Day (7 days shall be defined as 7 calendar days)</p> <p><b>See Table 2,3, &amp; 4 – Appendix B for Matrix</b></p>	<p>All Electrical Assets :</p> <p>A fault that should be included in the 7 day works programme for repair.</p> <p><b>Note :</b> Faults in the amber category will be designated as a 7 day priority, however the Street Lighting Engineer will have the discretion to increase this priority should he deem that other circumstances increase the fault as a greater hazard to users of the highway. For example an access to a facility that is frequented by vulnerable users.</p> <p>If the fault falls into this category the Street Lighting Engineer <b>MUST</b> record the reasoning behind his decision.</p>
<p>Cat-1 (2 hours) or Cat 1A (24 hours)</p> <p><b>See Table 2,3, &amp; 4 – Appendix B for Matrix</b></p>	<p><b>All Electrical Assets :</b></p> <p>Faults are to be assessed and repaired within either 2 hours (CAT 1) or 24 hours (CAT 1A)</p> <p>Note :</p> <p>Faults that are only made safe are to be made permanent by inclusion in the 7 or 28 day works programme.</p>



## Faults not under the ownership of the Council

During an inspection / attendance to a fault it may be determined that the responsibility is not with the Council to repair. The Council does however have a duty of care of the users of the highway. The staff involved in this activity shall therefore take steps to ensure that the party responsible for the repair are made aware of the fault and if necessary take interim action to make the fault temporarily safe if appropriate/possible.

## Statutory Undertakers / Western Power Apparatus

### ***Defective apparatus***

The network operator for the Milton Keynes area is Western Power an attendance to a fault may determine that defective apparatus causing the fault belongs to the Statutory Utility, the investigating officer/ crew shall record the defect and contact the utility in line with the procedures agreed by the New Roads and Streetworks Act (NRSWA) section, by the serving of a Section 81 notice.

### ***Defective reinstatements***

Where an attendance to a fault identifies a defective reinstatement belonging to a Statutory Undertaker (Western Power) that is still within the guarantee, this must be recorded. This information must be passed on to the NRSWA team who will serve the undertaker with a defect notice requiring them to take remedial action. A photograph may assist the NRSWA team.

## Unknown parties

Any emergency fault / apparatus attended where the owner is unknown shall be recorded and action taken to make the fault / apparatus safe if possible. Information shall be passed to the Highways Team and investigations shall then be undertaken to locate the responsible party.

## Vulnerable Road Users

Milton Keynes Council recognises the needs of vulnerable road users, i.e. wheel chair users, cyclists, people with prams/buggies and the visually impaired. Wherever possible these needs should be taken into account when prioritising faults for repair (see Table 1). However, works can only be carried out within current budget guidelines.

## Fault Priorities

Table 2 - Lamp Columns

Fault \ Location	Grid Road	All Other Roads (Estates, Rural & Industrials)	Redways	Underpasses	CMK
Lamp Out (single)	28 Days	7 Days	7 Days	7 Days	7 Days
Lamp Out (3 or more adjacent or single on R'about)	7 Days	7 Days	7 Days	7 Days	7 Days
Column Leaning (see note 1)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Dayburner (see note 3b)	28 Days	28 Days	28 Days	28 Days	28 Days
Damaged Lantern (see note 2)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Bowl Hanging	CAT 1A	CAT 1A	CAT 1A	N/A	CAT 1A
Water in Bowl	No Action	No Action	No Action	No Action	No Action
Request for Deflector Shield (see note 3)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment

Fault \ Location	Grid Road	All Other Roads (Estates, Rural & Industrials)	Redways	Underpasses	CMK
Exposed Wires	CAT 1	CAT 1	CAT 1	CAT 1	CAT 1
RTC (damage) / Column Failure (note 3a)	CAT 1	CAT 1	CAT 1	CAT 1	CAT 1

### Lamp Columns Notes

**Note 1 :** Columns to be inspected to determine stability, if column is not loose or less than 30 degrees from the perpendicular, otherwise job to be categorised as either CAT 1,1A,7 or 28 Day in accordance with inspectors assessment.

**Note 2 :** Lanterns to be inspected to determine damage, if lantern has only, if any immediate hazard is presented job to be categorised as either CAT 1,1A,7 or 28 Day in accordance with inspectors assessment.

**Note 3 :** Deflector shields are only to be fitted if the location is appropriate and the requestor pays the fee for materials and installation as per 'Fees and Charges' agreed by Cabinet. Suitability assessment to be provided by Ringway Street Lighting Engineer. The priority then becomes 'Planned'.

**Note 3a :** Following RTC or a structural failure the initial attendance shall be CAT1 to make safe. A job shall be raised to then replace the column on a 28 day priority. Specification as per Appendix A

**Note 3b :** Dayburner shall be treated as a 28 day repair and form part of the routine defect count for billing purposes. Any assets converted to LED within 12 months of scheme completion the works shall be raised as 28 day remedial

Fault \ Location	Grid Road	All Other Roads (Estates, Rural & Industrials)	Redways	Underpasses	CMK
Damaged Bollard (see note 4)	28 Days	7 Days	7 Days	7 Days	7 Days
Missing Bollard (see note 5)	CAT 1A	CAT 1A	N/A	N/A	CAT 1A
Bollard Unlit	7 Days	7 Days	N/A	N/A	7 Days
Traffic Signal not Working or damaged (see note 6)	Ring Imtech	Ring Imtech	N/A	N/A	Ring Imtech
Sign Unlit	7 Days	7 Days	7 Days	7 Days	7 Days
Dayburning Bollard or Sign	Planned	Planned	Planned	Planned	Planned
Damaged Electrical Sign (see note 7)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Exposed Wires	CAT 1	CAT 1	CAT 1	CAT 1	CAT 1

Table

RTC (damage)	CAT 1	CAT 1	CAT 1	CAT 1	CAT 1
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3 -

Electrical Street Furniture

## Electrical Street Furniture Notes

**Note 4 :** Bollards to be inspected to determine damage, if bollard has only minor damage and presents no hazard to highway user, if any immediate hazard is presented job to be categorised as either CAT 1,1A to make safe or 7 or 28 Day to replace in accordance with inspectors assessment. Also note that there is a programme of replacement of lit bollards to either LED or reflective. If it is necessary to replace the bollard this shall be done using the bollard unit identified in the electrical street furniture matrix table in Appendix A

**Note 5 :** Bollards that are missing shall be made safe under a CAT1 or 1A. Note that there is a programme of replacement of lit bollards to either LED or reflective. If it is necessary to replace the bollard with a new unit a new job raised under either 7 or 28 day shall be done specifying the bollard unit identified in the electrical street furniture matrix table in Appendix A

**Note 6 :** Note if Imtech are unable to attend immediately pass job as CAT 1 to erect 'Traffic Signals' not working signs on all approaches.

**Note 7:** Damaged electrical signs to be inspected to determine damage, if electrical sign has only minor damage and presents no hazard to highway user, if any immediate hazard is presented job to be categorised as either CAT 1,1A,7 or 28 Day in accordance with inspectors assessment. Note that there is a programme of replacement of lit signs to either LED or reflective signs. If it is necessary to replace the lit sign with a new unit a new job raised under either 7 or 28 day shall be done specifying the sign unit identified in the electrical street furniture matrix table in Appendix A

Table  
Non

	Location	Grid Road	All Other Roads (Estates, Rural & Industrials)	Redways	Underpasses	CMK
Fault						

4 -

Electrical Street Furniture

Damaged SNP (see note 8)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Missing SNP (see note 9)	Planned	Planned	Planned	Planned	Planned
Directional Sign damaged (see note 10)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Directional Sign missing (see note 11)	Planned	Planned	Planned	Planned	Planned
Chevron Sign damaged (see note 12)	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment	Visual Assessment
Chevron Sign missing(see note 13)	28 Day	28 Day	28 Day	28 Day	28 Day

**Non Electrical Street Furniture Notes**



**Note 8 :** Street Name Plates (SNP) shall be assessed first by a highways inspector to determine condition prior to any action. If the SNP is damaged to the point that it is a hazard to the public a CAT 1A response shall be raised. Otherwise job raised as 'Planned' category.

**Note 9 :** Raise job as 'Planned' category

**Note 10 :** Directional signs shall be assessed first by a highways inspector to determine condition prior to any action. If the sign is damaged to the point that it is a hazard to the public a CAT 1A response shall be raised. Otherwise job raised as 'Planned' category.

**Note 11:** Raise job as 'Planned' category

**Note 12:** Chevron signs shall be assessed first by a highways inspector to determine condition prior to any action. If the sign is damaged to the point that it is a hazard to the public a CAT 1A response shall be raised. Otherwise 28 Day.

**Note 13:** Raise job as '28 Day' category

## Prioritisation of Faults

CAT – 1 (2 Hours)  See Table 1 – Appendix. B

Faults presenting an immediate and imminent hazard or risk to highway users. Immediately make safe or repair within 2 hours. Such faults will include:

### Carriageway

- RTC's involving damage to electrical furniture or signs
- Exposed Wires
- Lantern Hanging that may imminently fail
- Damaged Column that may imminently fail
- Cat 1 column as determined by Structural Testing Programme 24hr or planned
- Seriously damaged traffic signals

### Footways / Redways

- Exposed electrical wiring on street furniture
- Any aspect of a column that may imminently fail

**CAT – 1A (24 Hours)**



see Table 1 – Appendix. B

Faults presenting a potential hazard or risk to risk users. Make safe or repair within 24 hours. Such faults will include:

**Carriageway**

- Bowl Hanging
- Missing Lit Sign
- Missing Lit or Reflective Bollard
- Any aspect of damaged electrical furniture or signs that have been visually assessed and in the opinion of the officer the repair can be prioritised for a 24 hour response priority

**Footways / Redways**

- Bowl Hanging
- Any aspect of damaged electrical furniture or signs that have been visually assessed and in the opinion of the officer the repair can be prioritised for a 24 hour response priority.

**CAT – 7 Days (7 days)**



see Table 1 – Appendix. B

Faults presenting a moderate level of hazard or risk. Repair within 7 days. Such faults will include:

Carriageways

- Single Lamp Out (see exception in 28 day category)
- 3 or more Lamps Out on a Grid Road i.e 'block of lights'
- Unlit Sign or Electrical Bollard
- Damaged Lit or Reflective Bollard

Footways / Redways

- Single Lamp Out
- Unlit Lighting – Underpass (apply vulnerable user test i.e. if next to school, under grid road, priority may be increased)

**CAT – 28 Days (28 days)**



see Table 1 – Appendix. B

Faults presenting a lower level of service or hazard or risk. Repair within small works programme. Such faults will include :

Carriageways

- Single Lamp Out on Grid Road
- Missing Numbers on lighting asset
- Missing Chevron
- Where works have been made safe any follow up works may fall into this category
- Day burners (all)
- Replacement Lanterns

Footways / Redways

- Where works have been made safe any follow up works may fall into this category

**CAT – Planned Works (Various)** [REDACTED] see Table 1 – Appendix. B

Faults presenting no hazard or risk. Repair within small works programme as and when budgets allow this work to be completed. Such faults will include:

Carriageways

- Peeling Paint on Lighting Columns
- Request for Deflector Shields (note : These are no longer funded by the authority – any request shall be funded by the requestor in accordance with ‘fees and charges’ agreed at Cabinet 2015).
- Missing SNP
- Missing Directional Sign

Footways / Redways

- As Above

## **Appendix C - Street Lighting Key Performance Indicators (KPI's)**

**Overarching Outcome** Efficiently planned and delivered maintenance

**KPI 1** **Response Times** Pain / Gain Indicator

**Definition and Target:** The time from the instruction was given (by or through a system) to confirmation that the instruction has been completed (by or through a system).

Target:

Category	Target
Emergency works (Cat 1, 1a)	100 %
28 day works	100%
Street Lighting	98%
Road Restraint Systems	100%
Highways Safety Inspections	100%
Street Lighting Electrical & Structural Inspections	100%

Next Joint Target Review - January 2014 (mobilisation)

**Calculation Matrix:** Percentage of works completed within the instructed time per category.

$$\frac{\text{Number of works completed within time}}{\text{Total number of works instructed}} \times 100 = ? \%$$

**Why are we measuring this:**

- Demonstrating statutory requirement to keep works safe
- The Council's potential liability is minimised
- Ensuring the service is delivered to the agreed standards

**How might measuring this make people behave and improve:**

- Correct resources assigned
- Question the definitions of the work categories and the process in order to develop towards efficient planned work

**How the data will be collected and on what frequency:** Contractor to furnish the percentage information to service manager on the agreed KPI spreadsheet by Tuesday 12.00Hrs each week

**What action will be taken if Target below target:**

- Will effect pain / gain calculation
- Reasons for non- performance and remedial action to be jointly agreed and monitored at management team meetings

**Who will this target be benchmarked against**

- MHA members at the quarterly FCB meetings

**Transitional Goal** To work towards an integrated delivery within an integrated team to enable the measure to be from when the work



	identified through ordering and delivery to time completed.
How	LEAN approach through 3 MHA pilots then to disseminate
Time line	April 2014

<b>Overarching Outcome</b>		Efficiently planned and delivered maintenance				
<b>KPI 2</b>	<b>Remedial work – Response times</b>	Pain / Gain Indicator				
<b>Definition and Target:</b>	<p>A defect is work not achieving the quality standards as set out in the service information and is to be corrected within the time stated by the Employer which minimises the adverse effect on the Employer or others</p> <p>The time from the instruction to carry out the remedial work and by what date was given (by or through a system) to confirmation that the work has been corrected (by or through a system).</p> <table border="1" data-bbox="596 813 1358 927"> <thead> <tr> <th></th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Completion of remedial work within the time scale given</td> <td>100 %</td> </tr> </tbody> </table> <p>Next Joint Target Review - January 2014 (mobilisation)</p>			Target	Completion of remedial work within the time scale given	100 %
	Target					
Completion of remedial work within the time scale given	100 %					
<b>Calculation Matrix:</b>	<p>Percentage of remedial works completed within the instructed time</p> $\frac{\text{Number of works completed within time}}{\text{Total number of works instructed}} \times 100 = ? \%$					
Why are we measuring this:	<ul style="list-style-type: none"> <li>To Ensure the service is delivered to the agreed standards</li> <li>To reduce additional network occupation</li> </ul>					
How might measuring this make people behave and improve:	<ul style="list-style-type: none"> <li>Promotes “right first time” mentality</li> </ul>					
How the data will be collected and on what frequency:	<p>Contractor to furnish the percentage information to service manager (or named) on the agreed KPI spreadsheet by first Tuesday of every month</p>					
What action will be taken if Target below target:	<ul style="list-style-type: none"> <li>Will effect pain / gain calculation</li> <li>Reasons for non- performance and remedial action to be jointly agreed and monitored at monthly management team meetings</li> <li>Potential for Employer to have defect corrected and to charge contractor (NEC)</li> </ul>					
Who will this target be benchmarked against	<ul style="list-style-type: none"> <li>MHA members at the quarterly FCB meetings</li> </ul>					
<b>Transitional Goal</b>	<p>To reduce the number of defects arising through an integrated delivery. To move towards a financial measure of percentage of cost of defects for schemes (e.g. a target of</p>					

	0.1% for total scheme)
How	Implement jointly with provider
Time line	April 2014

Overarching Outcome

Generate a culture of continual improvement

## KPI 3

### Customer Satisfaction

Pain / Gain  
Indicator

#### Definition and Target:

NHT Public Satisfaction Survey. This has a series of headline Key Benchmark Indicators (KBIs) and Benchmark Indicators (BIs) that measures public satisfaction with Pavements & Footpaths, Cycle routes and facilities, Condition of highways, Highway maintenance, Street lighting and Winter Maintenance. These results are presented in dashboard format as a series of tables.

The dashboard is structured to show:

1. How an Authority is currently performing
2. How an Authority's performance is changing over time
3. Where an Authority has the most potential to improve
4. Targets :

Category	Target
KBI 25 – Street Lighting	60%
KBI 24 – Highways Maintenance	55%
KBI 23 – Condition of Highways	40%
HMBI 10 Keeping Drains clear and working	60%
HMBI 15 – Undertakes Cold Weather Gritting	55%

Next Joint Target Review - January 2014 (mobilisation)

#### Calculation Matrix:

Percentage of people satisfied within each category/service area within the allocated annual survey. This percentage is then reported against the average for the grouping and identifies both the quartile and the percentage improvement required to move the service area into a higher quartile.

#### Why are we measuring this:

- We are measuring this data as this provides national benchmarking information amongst both unitary authorities and other highways authorities to enable us to compare performance of the identified services.
- Ensuring that the service is improving standards.
- Identify service area in need of improvement.

#### How might measuring this make people behave and improve:

Comparison and reporting of direct performance measures within a league table generates a culture of competition and improvement in order to improve your position.

#### How the data will be collected and on what frequency:

It is a postal survey, conducted by Ipsos Mori, with questionnaires sent to a minimum sample of 4,500 households in each participating local authority area. The survey takes place on an annual basis.

#### What action will be taken if Target below target:

- Will affect Pain/Gain calculation.
- Reasons for non-improvement and remedial action to be jointly agreed and monitored at management team meeting.

#### Who will this target be benchmarked against

The target will be benchmarked against both 40 other unitary authorities and 75 highway authorities in total.

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<b>Transitional Goal</b>	To develop a continuous improvement programme to improve customer satisfaction
How	Implement jointly with provider
Time line	October 2014 first survey

<b>Overarching Outcome</b>		Monitor/Review street lighting	
<b>KPI 55</b>	<b>Street Lights Available</b>	Pain /	Gain Indicator
<b>Definition &amp; Target:</b>	Number of street lights working at any time correctly, target better than 99%		
<b>Calculation Matrix:</b>	Number of lights not working correctly as recorded on CONFIRM divided by the total number of lights on the data base and expressed as a percentage		
Why are we measuring this:	The greater the number of lights not working the greater perception of a poor maintenance standard.		
How might measuring this make people behave and improve:	This is an industry standard that contractors will understand, it gives an indication how they are performing.		
How the data will be collected and on what frequency:	Based on the scouted faults loaded over a month and taken as an average for the period.		
What action will be taken if Target below target:	Review meetings with the Contractor and asked to explain if the difference is significant, 0.5% below target. Will expect to see this corrected in the next period.		
Who will this target be benchmarked against	The Contractor as this is another important measure of how they are performing.		

<b>Transitional Goal</b>	3 months from start
How	Monthly review of performance
Time line	3, 6, 9 and 12 month review.

<b>Overarching Outcome</b>		Monitor/Review street lighting (Grid Roads)
<b>KPI 55a</b>	<b>Street Lights Available</b>	Pain / Gain Indicator
<b>Definition &amp; Target:</b>	Number of street lights on grid roads working at any time correctly, target better than 98.5%  Annual 0.25% betterment	
<b>Calculation Matrix:</b>	Number of grid road lights not working correctly as recorded on CONFIRM (and supported by monthly scout reports) divided by the total number of lights on the data base and expressed as a percentage	
<b>Why are we measuring this:</b>	The greater the number of lights not working the greater perception of a poor maintenance standard.	
<b>How might measuring this make people behave and improve:</b>	This is an industry standard that contractors will understand, it gives an indication how they are performing.	
<b>How the data will be collected and on what frequency:</b>	Based on the scouted faults loaded over a month plus number of faults reported via CONFIRM and taken as an average for the period.	
<b>What action will be taken if Target below target:</b>	Review meetings with the Contractor and asked to explain if the difference is below target. Will expect to see this corrected in the next period.	
<b>Who will this target be benchmarked against</b>	The Contractor as this is another important measure of how they are performing.	

<b>Transitional Goal</b>	Target within 1 month
How	Monthly review of performance
Time line	Annual review

<b>Overarching Outcome</b>		
<b>KPI 56</b>	<b>Street Lights repaired</b>	Pain / Gain Indicator
<b>Definition &amp; Target:</b>	Street Lighting, Target for repairs of lights out is 5 days or less. Percentage of repairs undertaken by the contractor below the target against the total volume of repairs needed in the period (month). We will be looking for better than 98.5%.	
<b>Calculation Matrix:</b>	Number repaired in the period taken from CONFIRM divided by the total number and expressed as a percentage.	
Why are we measuring this:	This is an industry standard and allow us to compare service with adjacent authorities. (Was BV215a)	
How might measuring this make people behave and improve:	This will provide a perception of good maintenance standards with repairs carried out in a timely fashion.	
How the data will be collected and on what frequency:	Monthly from CONFIRM.	
What action will be taken if Target below target:	Reviewed monthly and shared, Contractor asked to review the way in which repairs are carried out if the target is not met.	
Who will this target be benchmarked against	The Contractor as this is a Performance Contract.	

<b>Transitional Goal</b>	To maintain required performance from day 1
How	Reductions to be agreed with contractor
Time line	Annually



<b>Overarching Outcome</b>		
<b>KPI 57</b>	<b>DNO repairs</b>	Pain / Gain Indicator
<b>Definition &amp; Target:</b>	Time taken to repair dead electrical supplies from notification, DNO supplies only, target 20 working days	
<b>Calculation Matrix:</b>	Dates taken from CONFIRM when notified to Western Power	
Why are we measuring this:	Lights out for long period will be attributed to our Contractor and the over quality of service, we may need to use labels to identify lights with dead supplies.	
How might measuring this make people behave and improve:	Public perception is that it is just another light out and that MK are not doing anything about repairing it, so knowing what is out, why it is out and when it is likely to be repaired is important.	
How the data will be collected and on what frequency:	Monthly from CONFIRM	
What action will be taken if Target below target:	Review meeting with Western Power, as this is a service we do not pay for we can only work on service standards that are in place from OFGEM.	
Who will this target be benchmarked against	Western Power, in conjunction with the Contractor for street lighting maintenance.	
<b>Transitional Goal</b>	3 months	
How	Monthly reviews	
Time line	3,6,9 and 12 moth reviews	

<b>Overarching Outcome</b>		Efficiently planned and delivered customer response						
<b>KPI 59</b>	<b>Customer Enquiries</b>	Pain / Gain Indicator						
<b>Definition and Target:</b>	<p>The time from the enquiry was given (by or through a system) to confirmation that the enquiry has been completed (by or through a system).</p> <p>Target: Within 10 calendar days of receipt in system</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Highways</td> <td>100 %</td> </tr> <tr> <td>Street lighting</td> <td>100%</td> </tr> </tbody> </table> <p>Next Joint Target Review - January 2017</p>		Category	Target	Highways	100 %	Street lighting	100%
Category	Target							
Highways	100 %							
Street lighting	100%							
<b>Calculation Matrix:</b>	<p>Percentage of enquiries actioned (works raised or enquiry complete) within the instructed time per category.</p> <p><u>Number of enquiries actioned within time</u> X 100 = ? %</p> <p>Total number of enquiries received</p>							
Why are we measuring this:	<ul style="list-style-type: none"> <li>• Demonstrating effective customer response</li> <li>• Support the efficient completion of works</li> <li>• Ensuring the service is delivered to the agreed timescales/standards</li> </ul>							
How might measuring this make people behave and improve:	<ul style="list-style-type: none"> <li>• Correct resources assigned to manage enquiries</li> <li>• Ensure correct processes are in place in order to ensure efficient planned work</li> </ul>							
How the data will be collected and on what frequency:	<p>Contractor to furnish the percentage information to service manager on the agreed KPI spreadsheet Monthly or at more frequent intervals if requested</p>							
What action will be taken if Target below target:	<ul style="list-style-type: none"> <li>• Reasons for non- performance and remedial action to be jointly agreed and monitored at the Highways Operations Board</li> <li>• Recorded on Contract Issues Log</li> </ul>							
Who will this target be benchmarked against	<ul style="list-style-type: none"> <li>• MHA members at the quarterly FCB meetings</li> </ul>							

<b>Transitional Goal</b>	<p>To work towards a fully functional team capable of dealing with all enquiries throughout the full year in line with targets through receipt to time completed.</p> <p>Lean Review will be carried out by MKC of 'end to end' April 2016. Integrated into the new MKC front end system (Firmstep), assisted by the introduction of new Code of Practice for Street Lighting.</p>
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How	LEAN approach through 3 MHA pilots then to disseminate
Time line	April 2016

## **Appendix D**

### **Street Lighting**

#### **Operational Requirements/Design Considerations – Milton Keynes**

## Siting of Street Lighting Columns

Replacement lighting schemes where possible incorporate columns being positioned in original column locations, but may need re-alignment due to site factors. This provides a cost-effective solution regarding electrical service connections by the DNO (Distribution Network Operator)

The BS 5489-1:2013 (British Standard) 'Code of Practice for the design of road lighting' recommends that street lighting columns should be set back from the kerb edge of a highway, a minimum dimension of 0.8 metre on roads with a 30 mile per hour speed restriction, and 2.0 metre minimum setback for roads with a 70 mile per hour speed restriction.

### *Particular*

Where, due to design requirements, replacement columns may require siting in new positions i.e. not in the existing lighting column locations, the new columns' positions shall preferably be located on the dividing line between household properties or business premises, or level with the gable-end of properties and to the back of the footpath but in positioning replacement columns consideration must be given to the need for illumination to be projected onto the adjacent carriageway. This may require that any replacement lighting columns would require siting in the same position as the original. (For example in those streets which are heavily lined with trees). There may be other circumstances when positioning the replacement lighting column to the rear of an existing footpath is also inconvenient to householders or business premises as they can be used as climbing accessories which can be a nuisance or an aid to vandalism or indeed can be used to illegally gain access to these properties.

In these circumstances the siting of a replacement column in this situation should not involve repositioning to the rear of the footpath.

Care should be taken to avoid siting columns directly outside property windows to avoid potential light pollution towards adjacent properties. Columns should not be sited in drop crossings or immediately adjacent to telegraph poles. Columns should not be sited close to privately owned trees or trees within the adopted highway, which, due to foliage may cause obstruction of the light emitted from the particular column mounted luminaire.

The positioning of columns adjacent to existing trees is particularly relevant with regard to the installation of new columns which, in the act of installation, may cause damage to existing tree roots and must be avoided.

Requests for the provision of a shield, baffle or louvre be fitted to a luminaire will normally be resisted except in exceptional circumstances due to the cost of installation and the fact that shields affect the lighting distribution on the road and are somewhat unsightly.

The illumination falling on a property frontage should not exceed the limits shown in Table 1 in the 'ILP Guidance Notes for the reduction of Obtrusive Light 2011'. Therefore when

replacing columns towards the rear of the footpath which were originally sited towards the front of footway the illumination falling on properties should be reassessed.

The setback of replacement columns should be limited to footpaths which are up to a maximum width of 3.0 metres. Careful attention should be given to providing enough room for prams or wheelchairs to pass replacement lighting columns newly sited on footways.

## Lanterns

The generally preferred light source is LED's. For a list of approved LED units and approved designation please refer to matrices in Appendix A

All lanterns used in street lighting shall contain an acceptable optical system to direct light onto the highway within the limits set within the table Light Intensity Classes (from EN13201-1). To ensure the minimum environmental pollution to the 'night sky' the amount of downward light from the lantern should be better than 80%

All lanterns should be manufactured to a minimum of IP (Ingress Protection) 65 and BS 5490 for the lamp containment area, and should be manufactured from vandal- resistant material. Lanterns should be sufficiently robust to give a normal operating life of 25 years.

## Underground Cable and Cable Duct

### Underground Cable

Road lighting service cable shall consist of B.A.S.E.C. approved XLPE/PVC/SWA/XLPE cable with copper conductors, the outer sheath being black in colour.

The cable will consist of 2, 3 or 4 cores, and the conductors shall be identified by the appropriate colours specified in BS7671 'Requirements for Electrical Installations'.

### Underground Cable Duct

Where road lighting service ducts are specified they shall be thick walled high density polythene with smooth bore of 50/100/150mm in diameter, orange in colour and printed with "STREET LIGHTING" lettering at intervals of not more than one metre throughout its length.

Ducts shall be impervious to water, capable of being laid in temperatures down to -10 degrees Celsius and sufficiently flexible to follow any undulations in a trench bottom and be supplied in 3 or 6 metre lengths, each length shall be supplied with a welded collar.

Cable duct laid in verges and footways shall have a minimum cover of 450mm and shall have a covering of acceptable material.

Cable laid under driveways shall have a minimum cover of 450mm and shall be protected by a concrete surround of mix ST2 concrete or similar as directed by the Authority.

Cable duct laid under carriageways shall be 100mm in diameter and have a minimum cover of 750mm and shall be protected by a concrete surround of mix ST2 or similar as directed by the Authority.

At least 75mm minimum clearance shall be given between the cable duct and the sides of the trench and between ducts sharing the same trench. At least 150mm minimum clearance shall be given between the cable ducts and service pipes belonging to other Statutory Undertakers.

## Milton Keynes Cable Networks

Within Milton Keynes there are street lighting columns which are presently electrically supplied through underground cable systems which as they grow older are becoming maintenance liabilities. These cable systems, generally feed older lighting columns, this is termed 'Private Network Cabling System.'

## Private Network Cabling System

This cabling system, again generally in established older parts of the highway network (including Grid Roads), consists of old underground aluminium cable of varying configurations, but fundamentally belongs to and is the responsibility of Milton Keynes Council.

This cable system electrically supplies generally older columns. This existing cable can be jointed underground or can be looped direct from column to column. As a general principal rather than jointing the cable it is preferable to lay a new length of cable to eliminate excessive joints.

Private cable networks belonging to Milton Keynes Council are controlled and maintainable by Milton Keynes Council. Generally these cabling systems electrically supply lighting columns consisting of equipment that has reached the end of its useful life and is due for replacement. To address this the strategy of inspecting and reviewing the cabling and feeder pillars will take place in advance of column replacement schemes.

When unscheduled 'failure of supply', or individual 'dead services' occur on these types of cable systems supplying older lighting column installations, it becomes cost effective to design and install a new street lighting scheme which would be jointed direct onto the WP mains underground cable via the feeder pillar.

This kind of underground cable fault development creates differing priorities for street lighting budgetary management in that the fault may require immediate revenue funding to relight a particular highway, or if the fault can be temporarily repaired may allow the relighting of that particular highway to be incorporated into the annual rolling programme of street lighting capital schemes to be carried out within a given time period, subject to availability of funds.

The nature of underground cable faults, not being predictable, requires that occasionally the relighting of various highways have to be incorporated into the rolling programme and may require immediate prioritisation over other schemes.

## Feeder Pillars

The feeder pillars shall not rely on the earth provided by the electrical supply company but shall be earthed separately by means of an earth rod. Earthing shall conform to BS 7430.

The isolation equipment shall be a distribution board complete with isolator switch and appropriate fuse/circuit breakers.

Type 1 – 150mm x 700mm sub circuit pillars (mini pillar)

Type 2 – 600mm x 700mm Small single phase pillar (Midi Pillar)

Type 3 – 750mm x 1.0m Single Phase / Three phase pillar (Standard)

Type 4 – 1.2m x 1.2m Three Phase Pillar (large)

## Earth Stakes

The earth rod that is installed at “end of circuit” is to reduce the Earth Fault Loop Impedance reading and to provide a separate earth in case of failure. These should be installed only if we have a poor EFLI reading at end of line of the circuit.

An Earth Matrix should be installed at the feeder pillar “install a earth rod – test, install a second earth rod – test, install third Earth Rod – test until a satisfactory reading is attained. A copper tape is then used to connect these up and a 25mm Earth Cable taken into the feeder pillar and connected to the main earth Bar, this then provides a subsidiary Earth “in case of failure”.

## Street Lighting Cut Outs

Cut outs shall be complete with an integral 32 amp double pole isolator and dependent upon the number of outgoing circuits, 1,2 or 3 HRC fuses complying with the requirements of BS88 category of duty 230v AC 16 rating Class Q1. Fuse ratings shall be in accordance with the manufacturer’s recommendations.

Interlocking shall insure that the fuse carrier cannot be inserted or withdrawn under load conditions.

A clear “OFF” indication shall be provided when the unit has been isolated and a locking off facility shall be provided in the OFF position only.

The design of the cut-out shall be such that it is possible to incorporate facilities, integral within the unit, for the termination of an additional Local Authority outgoing fused circuit.

A gland plate shall form an integral part of the unit that shall be capable of terminating up to 3 cables with cross sectional areas (CSA) of up to 10.0 sq.mm (25mm).

Terminals shall be sufficient to allow the termination of conductors with a CSA of up to 25.0 sq.mm.

The design of the cut-out shall be such that there is no possibility of contact with live parts during electrical testing.



## Column Painting

Refer to Contract Documents for Highways, Street Lighting and Network term contract documents – Contract Data – Specification 4.1

## Illuminated Bollards & Street Furniture

All new bollards to be LED with a photocell.

When the bollard is within 5m of a traffic signal and any sign on the bollard is facing in the same direction as the signal head and where the speed limit is 40mph or below, then it is preferred to use non-illuminated bollards with all round reflectivity.

Bollards should only be fed by private cable via sub-circuit fuse units from the nearest lighting position or feeder pillar. Where a central beacon is installed along with bollards on a refuge, the beacon shall be the first radial point of the sub-circuit.

Flat, self-righting, retro-reflective bollards, complying with BS 8442, may be erected so long as they do not incorporate a traffic sign.

If a traffic bollard incorporates a sign – i.e. diagram 610 or 611 arrow – certain circumstances dictate that they be illuminated.

Illuminated signs should no longer be attached to Lighting columns. The signs should have a dedicated broad base post. Where existing signs are attached to a column these should be given a dedicated post when being replaced at the end of their useful life. Alternatively the structural strength of the column will be tested to see if it is adequate to support such a sign or the column designed specifically to accommodate the sign.

Signs that are currently internally lit should be replaced when either damaged or requiring replacement through fair wear and tear by either non-illuminated signs or externally illuminated as prescribed under the Traffic Signs Regulations and General Directions 2002 (TSRGD 2002). Consideration should be given to the installation of 3D Diamond Graded or solar powered signs where appropriate and when the technology and cost prove to be financially viable.

For any supplementary equipment on columns use a steel 20mm compression gland with a tapped 20mm hole in column

## Photo Electric Cells

These are at present mini cells SS12 on all new LED units but these are a mixture of 2 part cells and nema cells.

## CMS Units

A CMS system to be installed that will incorporate either a nema socket or direct wired into the mini cell aperture

## Traffic Signals

Imtech are T/S supplier/maintenance, traffic signals, spec needs to be put into this as they from part of the highways electrical system

## Glossary

- a. **Authorised Officers** – An officer employed by MKC/Ringway within the respective Street Lighting teams directly involved with street lighting operations.
- b. **MK Code of Practice for Street Lighting Maintenance** – The Code of Practice, which prescribes the operations and scope of street lighting in Milton Keynes.
- c. **Service Team Plan** – A working document issues by Highways Services management, which sets targets and deadlines for work areas under its management.
- d. **Procedures** – Specifies safe-working practices associated with undertaking street lighting.
- e. **Fault Database** – Computerised database for storing the Street Lighting data and organising repair works.

## Reference Documents

- a. The Milton Keynes Council Code of Practice for Street Lighting Maintenance
- b. UKLRG Code of Practice for Street Lighting Maintenance – Last Revision October 2013
- c. MOSLAR

## **Appendix E**

### **Street Lighting – Code of Practice**

### **Standard Details – Milton Keynes**

(to be added)