ELECTRICITY INDUSTRY PARTICIPATION CODE DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

HOROWHENUA DISTRICT COUNCIL AND GENESIS ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 26 November 2018

Date audit report completed: 5 December 2018

Audit report due date: 18-Dec-18

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EXECUTIVE SUMMARY

This audit of the Horowhenua District Council (**HDC**) DUML database and processes was conducted at the request of Genesis Energy Limited (**Genesis**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

A RAMM database is managed by Horowhenua District Council (HDC) with monthly reporting to Genesis. The field work, asset data capture and database population is conducted by Fulton Hogan and HDC staff.

The field audit was undertaken of a statistical sample of 256 items of load on 27th November 2018 and this was found to be outside the database accuracy threshold of +/- 2.5%.

The audit found four non-compliances. The future risk rating of 13 indicates that the next audit be completed in 12 months and I agree with this recommendation. The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum. One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.	Moderate	Medium	4	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.	Strong	Low	1	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum. One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum. One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.	Moderate	Medium	4	Identified
Future Risk Rating						13	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Recommendation
		Nil	

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

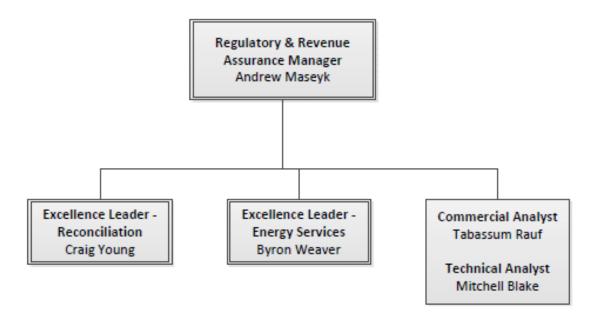
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Genesis provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Title
Rebecca Elliot	Lead Auditor
Debbie Anderson	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Brent Tucker	Roading Officer	Horowhenua District Council
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist – Reconciliations Team	Genesis Energy

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

HDC confirmed that the database back-up is in accordance with standard industry procedures. The database is password protected.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number Description		Description	Profile	Number of items of load	Database wattage (watts)
	0016099004EL9CA	HDC - STREETLIGHTS	CST	2573	101,470

1.7. Authorisation Received

All information was provided directly by Genesis or HDC.

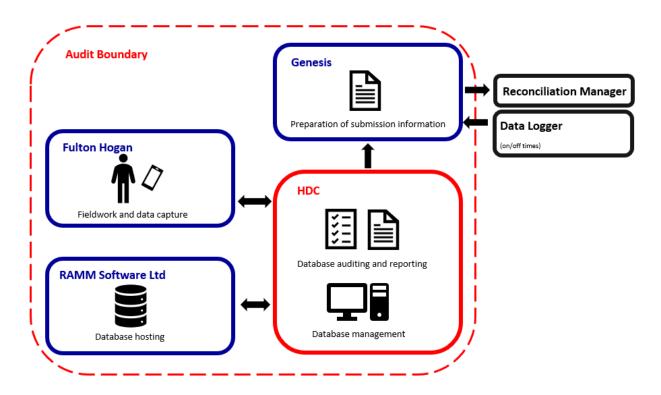
1.8. Scope of Audit

This audit of the Horowhenua District Council (**HDC**) DUML database and processes was conducted at the request of Genesis Limited (**Genesis**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The database is remotely hosted by RAMM Software Ltd, and managed HDC. Field work and asset data capture for faults and maintenance is conducted by Fulton Hogan with updates from the field into the database. HDC reports to Genesis on a monthly basis.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 256 items of load on 27th November 2018.

1.9. Summary of previous audit

The last audit was undertaken by Tara Gannon of Veritek Limited in March 2018. The table below records the findings.

Subject	Section	Clause	Non-compliance	Status
Description of Load Type	2.1	11(1) of Schedule 15.3	The database used to prepare submissions contains some inaccurate information.	Still Existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	For the sample of 203 lamps checked, two lamps were not recorded in the database. Six lamps situated at Muhunoa West Road, Ohau are located in tunnels and the burn hours differ from other lamps connected to the ICP.	Cleared

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2	HDC applies unapproved profiles to adjust specified lamp wattages to account for different dimming. 129 recorded lamp wattages differ from expected values. 50 wattage differences and two lamp count differences were found for the sample of 203 lamps checked. Six lamps situated at Muhunoa West Road, Ohau are located in tunnels and the burn hours differ from other lamps connected to the ICP.	Cleared
Volume information accuracy	3.2	15.2	The database used to prepare submissions contains some inaccurate information.	Still Existing

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

- 1. by 1 June 2018 (for DUML that existed prior to 1 June 2017)
- 2. within three months of submission to the reconciliation manager (for new DUML)
- 3. within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.

Audit observation

Genesis have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

Audit outcome

Compliant

2. **DUML DATABASE REQUIREMENTS**

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- DUML database is up to date
- methodology for deriving submission information complies with Schedule 15.5.

Audit observation

The process for calculation of consumption was examined, and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the CST profile.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from the HDC's RAMM database and the "burn time" which is sourced from data loggers. The methodology is compliant.

I checked the submission values for October 2018 to the monthly report provided to Genesis by HDC and the values match exactly.

While Genesis are using up to date database information, there is some inaccurate data within the database:

Database discrepancies	Estimated volume information impact (annual kWh)
The field data was 105.1% of the database data for the sample checked. This will result in estimated under submission of 22,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).	22,000 under submission
One 22W LED does not have an ICP number recorded against it.	94 kWh per annum under submission.

This is recorded as non-compliance below and in sections 2.2, 3.1 and 3.2.

Audit outcome

Non-compliant

Non-compliance	ce Description				
Audit Ref: 2.1 With: Clause 11(1) of	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum.				
Schedule 15.3	One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.				
	Potential impact: Medium				
	Actual impact: Medium				
From: 01-Apr-18	Audit history: Once				
To: 26-Nov-18	Controls: Moderate				
10.20 1101 20	Breach risk rating: 4				
Audit risk rating	Rationale for	audit risk rating			
Medium	The controls are rated as moderate, bec information is correctly recorded most o	-	icient to ensure that lamp		
	The impact is assessed to be medium, based on the kWh differences described above.				
Actions t	aken to resolve the issue	Completion date	Remedial action status		
missing information has be populated against the cor	e information provided by HDC, the been rectified and now has the asset rect ICP. The identification of the on has been fed back to HDC.	01/12/2018	Identified		
Preventative actions take	en to ensure no further issues will occur	Completion date			
•	ata provided by the contracted party, will to maintain data accuracies through ential improvements.	01/12/2018			

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- each ICP identifier for which the retailer is responsible for the DUML
- the items of load associated with the ICP identifier.

Audit observation

The database was checked to confirm the correct ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded against them except one, a parks and properties 22W LED with a house address of Playford Park Road (By Scout Hall).

Audit outcome

Non-compliant

Non-compliance	Description			
Audit Ref: 2.2 With: 11(2)(a) and (aa) of Schedule 15.3	One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission. Potential impact: Low Actual impact: Low Audit history: None			
From: 01-Apr-18 To: 26-Nov-18	Controls: Strong			
10. 20 100 13	Breach risk rating: 1			
Audit risk rating	Rationale for audit risk rating			
Low	The controls are rated as strong because only one item does not have an ICP number recorded against it.			
	The impact is low because of the kWh as discussed above.			
Actions to	aken to resolve the issue	Completion date	Remedial action status	
Genesis has reviewed the information provided by HDC, the missing information has been rectified and now has the asset populated against the correct ICP.		01/12/2018	Identified	
Preventative actions taken to ensure no further issues will occur		Completion date		
will continue. With the in	ata provided by the contracted party, tent to maintain data accuracies nting potential improvements.	01/12/2018		

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the road name and house address which are populated for all items of load.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- a description of load type for each item of load and any assumptions regarding the capacity
- the capacity of each item in watts.

Audit observation

The database was checked to confirm it contained a field for lamp type and wattage capacity and included any ballast or gear wattage, and that each item of load had a value recorded in these fields.

Audit commentary

The database contains the manufacturers rated wattage and the ballast wattage. The extract provided has fields for lamp make model and model, and all were populated. The accuracy of the lamp description, capacity and ballasts recorded is discussed in **section 3.1**.

Audit outcome

Compliant

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of a statistical sample of 256 items of load on 27th November 2018.

Audit commentary

The field audit findings for the sample of lamps are detailed in the table below:

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Parks & Prop					
DAWICK STREET	2	2			
DONNELLY PARK ROAD	9	9			
HARTLEY STREET	5	5			
MAIN STREET	6	6			
MUHUNOA EAST ROAD	2	2			
QUEEN STREET WEST	4	4		1	1 x incorrect wattage 70W HPS found in the field not 22W LED
Roading A-D					

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
AVENUE ROAD (FXT)	18	18			
BARRY CURTIS PLACE	9	9			
CAMPBELL GROVE	2	2		2	2 x incorrect wattages 70W HPS found in the field not 22W LED
COBHAM STREET	5	5			
COLEY STREET	8	8			
CORFE CASTLE LANE	5	5			
DAWICK STREET	5	5			
DOUGLAS STREET	8	8			
Roading E-L					
EDINBURGH STREET	5	5			
GIMBLETT COURT	2	2			
GUY AVENUE	4	4			
HANNAN STREET	5	5			
HARTLEY STREET	13	13			
HEREFORD STREET	2	2			
HERRINGTON STREET	8	8			
KINGS DRIVE	7	7			
LAKEVIEW DRIVE	1	1			
Roading M-P					
MALTHUS PLACE	3	3			
MARSDEN STREET	3	3			
MATAI STREET (LVN)	2	2			
MUHUNOA EAST ROAD	13	13		4	2 x incorrect wattages 70W HPS found in the field not 22W LED 2 x incorrect wattages 100W HPS found in the field not 22W LED
PARK STREET	11	11			
PERTH STREET	7	7			
Roading Q-R					
QUEENWOOD ROAD	18	18			
QUINN ROAD	5	5			
RATA STREET (LVN)	3	3			
REGAL STREET	2	2			-
REGENT LANE NORTH	3	3			
ROOSEVELT STREET	5	5			
RUTLAND STREET	3	3			
RYDER CRESCENT	6	6			
Roading S-Z	•				
SHAMROCK STREET	3	3			
TAINUI STREET	3	3			

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
TASMAN STREET	3	3			
WINCHESTER STREET	23	23			-
WRIGHT GROVE	5	5			
Grand Total	256	256	0	7	

This clause relates to lights in the field that are not recorded in the database. The field audit discovered seven incorrect lamp wattages over three roads. No additional lights were found in the field.

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

On 20th September 2012 the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as the database contained an audit trail. I have interpreted this to mean that the production of a monthly "snapshot" report is sufficient to achieve compliance.

The database tracks additions and removals as required by this clause.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance.

Alf Downs no longer undertakes any work for HDC. Fault and maintenance work is completed by Fulton Hogan in the field using PDAs.

Where major upgrades are undertaken, such as the replacement of sodium lights with LEDs, an audit is carried out by HDC staff on completion of the job to ensure all records are updated correctly. Fulton Hogan have their own internal quality management systems which also require checks of work completed and RAMM updates made. The LED replacement project has seen all 70W HPS lights replaced and the remaining higher wattages, approx. 270 of them, are intended to be replaced within the next three months.

HDC are responsible for recording new connections in the database. Each new connection application to the Network includes an "as built" plan. A site check is performed prior to approval and once the lamps are livened the database is updated. Livening is normally conducted by the developer or the Distributor, with updates to the database performed within two weeks. No issues with new connections were identified during the audit.

Regular movement analysis is undertaken on the database by HDC and recent changes made are checked against field Invoices.

The database contains Christmas lighting, which is turned on in early December and off in mid-January. These items of load are identified in the database as "Festive" lighting and are noted, but excluded, in the report every month except when they are switched on. Genesis include these lights for submissions during the period in which they are switched on.

HDC relies on the Public to advise of lights which need to be maintained.

Private and NZTA lights are recorded in RAMM for information purposes and excluded from submission data

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- the before and after values for changes
- the date and time of the change or addition
- the person who made the addition or change to the database.

Audit observation

The database was checked for audit trails.

Audit commentary

The database has a complete audit trail.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments	
Area of interest	Horowhenua District Council region	
Strata	The databases contain 2,573 items of load in the Horowhenua area. The processes for the management of all HDC items of load is the same. I selected the following strata: Parks & Property Roading A-D Roading E-L Roading M-P Roading Q-R	
	Roading S-Z	
Area units	I created a pivot table of the roads in each database and used a random number generator in each spreadsheet to select a total of 42 sub-units.	
Total items of load	256 items of load were checked.	

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

Audit commentary

A statistical sample of 256 items of load found that the field data was 105.1% of the database data for the sample checked. This is outside the required database accuracy of 2.5%+/-. The statistical sampling tool reported with 95% confidence the precision of the sample was 15.4% and the true load in the field will be between 99.4% to 114.8% of the load recorded in the database. The sample is not sufficiently precise to be able to determine the database accuracy but indicates that the database is potentially under submitting.

The tool indicated that there is potentially 22,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of under submission. The statistical sampling tool reported with 95% confidence that there is a potential estimated submission variance range of between 2,700 kWh per annum over submission and 64,100 kWh per annum under submission.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and all were correct.

As detailed in **section 2.2**, one 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.

Audit outcome

Non-compliant

Non-compliance	Description					
Audit Ref: 3.1 With: Clause 15.2 and	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum. One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.					
15.37B(b)						
From: 01-Apr-18	Potential impact: Medium					
To: 26-Nov-18	Actual impact: Medium					
	Audit history: Once					
	Controls: Moderate	Controls: Moderate				
	Breach risk rating: 4					
Audit risk rating	Rationale for audit risk rating					
Low	The controls are rated as moderate, because they are sufficient to ensure that the database is accurate most of the time.					
	The impact is assessed to be medium, based on the kWh differences described above.					
Actions taken to resolve the issue		Completion date	Remedial action status			
Genesis has reviewed the information provided by HDC, the missing information has been rectified and now has the asset populated against the correct ICP. The identification of the potential under estimation has been fed back to HDC.		01/12/2018	Identified			
Preventative actions taken to ensure no further issues will occur		Completion date				
Genesis analysis of the data provided by the contracted party, will continue. With the intent to maintain data accuracies through feedback highlighting potential improvements.		01/12/2018				

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- volume information for the DUML is being calculated accurately
- profiles for DUML have been correctly applied.

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that the ICP has the correct profile and submission flag
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles this DUML load using the CST profile.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from the HDC's RAMM database and the "burn time" which is sourced from data loggers. The methodology is compliant.

I checked the submission values for October 2018 to the monthly report provided to Genesis by HDC and the values match exactly.

Volume inaccuracy is present as follows:

Database discrepancies	Estimated volume information impact (annual kWh)
The field data was 105.1% of the database data for the sample checked. This will result in estimated under submission of 22,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).	22,000 under submission.
One 22W LED does not have an ICP number recorded against it.	94 kWh per annum under submission.

Audit outcome

Non-compliant

Non-compliance	Description				
Audit Ref: 3.2 Clause 15.2 and	The database accuracy is assessed to be 105.1% indicating an estimated under submission of 22,000 kWh per annum.				
15.37B(c)	One 22W LED does not have an ICP number recorded against it, amounting to 94 kWh per annum under submission.				
	Potential impact: Medium				
	Actual impact: Medium				
From: 01-Apr-18	Audit history: Once				
To: 26-Nov-18	Controls: Moderate				
10.20 100 10	Breach risk rating: 4				
Audit risk rating	Rationale for audit risk rating				
Medium	The controls are rated as moderate, because they are sufficient to ensure that the database is accurate most of the time.				
	The impact is assessed to be medium, based on the kWh differences described above.				
Actions taken to resolve the issue		Completion date	Remedial action status		
Genesis has reviewed the information provided by HDC, the missing information has been rectified and now has the asset populated against the correct ICP. The identification of the potential under estimation has been fed back to HDC.		01/12/2018	Identified		
Preventative actions taken to ensure no further issues will occur		Completion date			
Genesis analysis of the data provided by the contracted party, will continue. With the intent to maintain data accuracies through feedback highlighting potential improvements.		01/12/2018			

CONCLUSION

A RAMM database is managed by Horowhenua District Council (HDC) with monthly reporting to Genesis. The field work, asset data capture and database population is conducted by Fulton Hogan and HDC staff.

The field audit was undertaken of a statistical sample of 256 items of load on 27th November 2018 and this was found to be outside the database accuracy threshold of +/- 2.5%.

The audit found four non-compliances. The future risk rating of 13 indicates that the next audit be completed in 12 months and I agree with this recommendation.

PARTICIPANT RESPONSE

Genesis continues to work with HDC to provide feedback on the information provided, highlighting any potential inaccuracies. HDC led implementation will see the remaining 70w lamps replaced by 01/03/2019, Genesis will actively revise the information provided, Genesis accepts, the 12 month review recommendation.