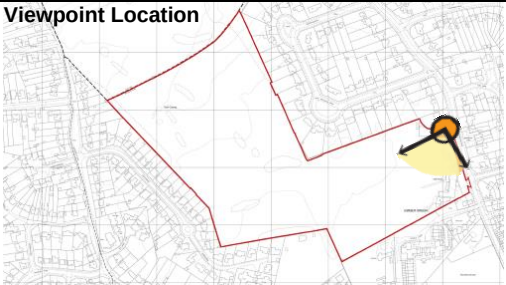
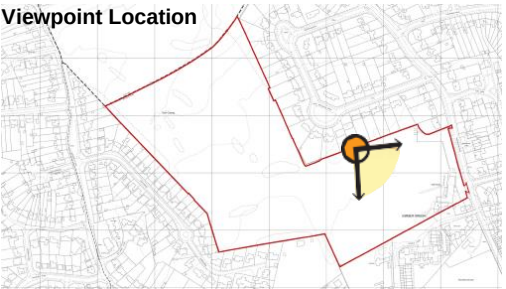
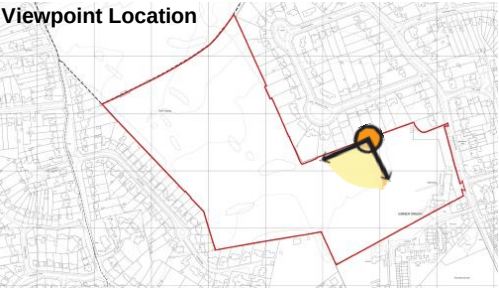
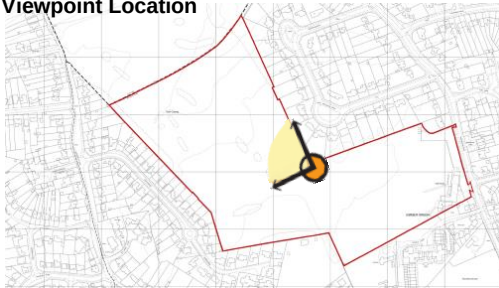


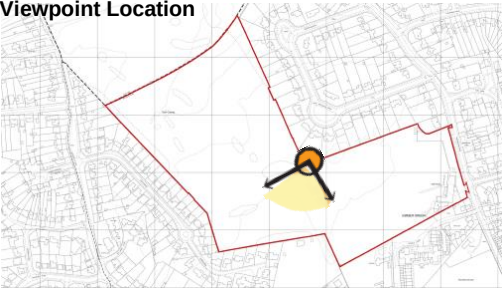
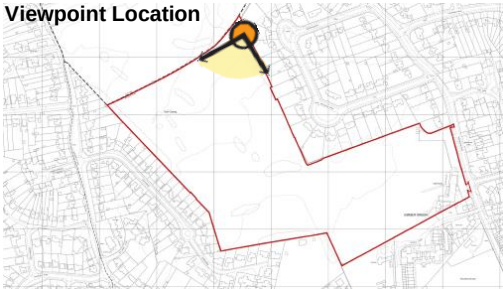
Appendix E Representative Photographs

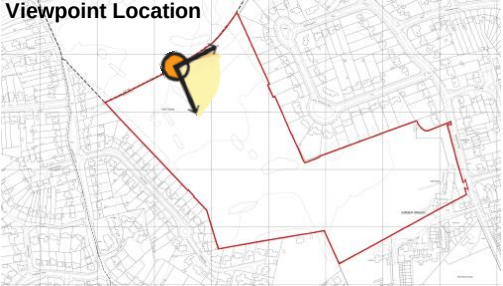
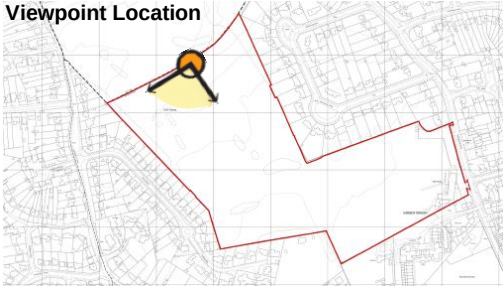
Location 1 Description: view from the eastern corner of the Application Site, looking south to south west.	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> RGC clubhouse amenity lighting and external metal halide (MH) lighting, Lyefield retirement complex amenity lighting, and distant residential amenity lighting from Eric Avenue. <u>Light Spill, Glare and Sky glow:</u> minor light spill from RGC amenity lighting and glare from external MH lighting. Prominent sky glow south of Site. <u>Screening:</u> mature vegetation and well-established hedgerow screens most of Kidmore End Road. <u>Primary Receptors:</u> resident of adjacent dwelling, residents of Lyefield retirement complex, and foraging bats. Viewpoint Location 
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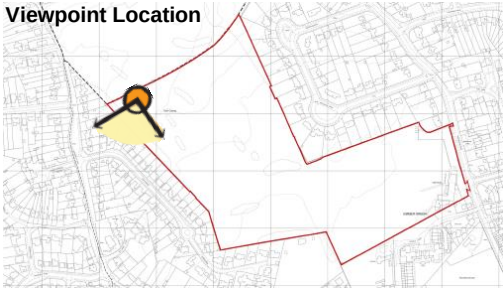
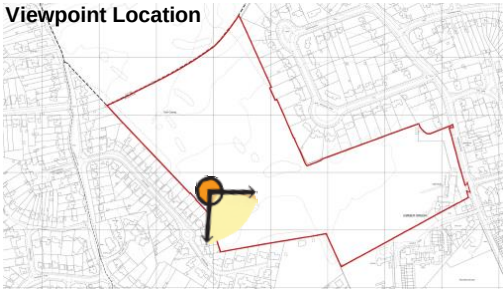
Location 2 (south east facing) Description: view from opposite Brooklyn Drive, looking south east towards RGC clubhouse	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> RGC clubhouse amenity lighting and external wall mounted MH lighting. Car park bollard parking also visible to left of RGC clubhouse. Distant residential lighting from properties behind the clubhouse on Kidmore End road. <u>Light Spill, Glare and Sky glow:</u> glare from RGC external MH light and car park bollard lighting. Minor light spill from RGC amenity lighting. <u>Screening:</u> no screening from RGC clubhouse. Screening from residential properties on Brooklyn Drive along boundary. <u>Primary Receptors:</u> resident of adjacent dwelling and foraging bats. Viewpoint Location 
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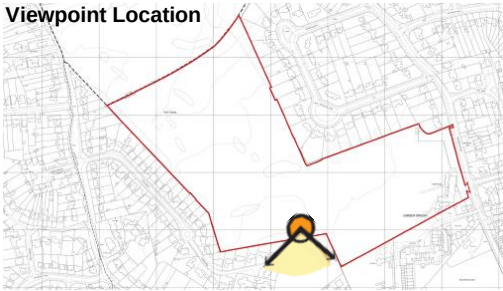
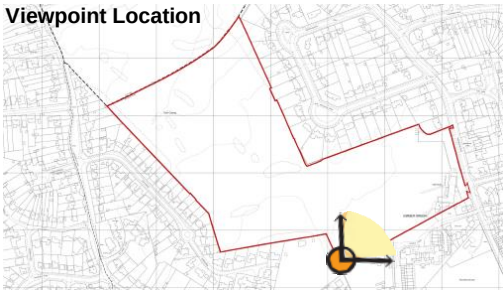
Location 2 (south west facing) Description: view from opposite Brooklyn Drive, looking south west. This is a continuation of the photograph above in Location 2 (south east facing).	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> distant residential amenity/security lighting along Gorselands and Eric Avenue. <u>Light Spill, Glare and Sky glow:</u> prominent sky glow to the south of the Application Site. <u>Screening:</u> good screening from mature vegetation within and along the site boundary. <u>Primary Receptors:</u> Foraging bats.
	Viewpoint Location 

Location 3 (north facing) Description: view from corner opposite Brooklyn Drive beneath veteran oak, looking north towards the golf course.	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> none visible from this location. <u>Light Spill, Glare and Sky glow:</u> none visible from this location. <u>Screening:</u> mature vegetation within Application site, as well as within the golf course outside the boundary area. <u>Primary Receptors:</u> potential roosting and foraging bats.
	Viewpoint Location 

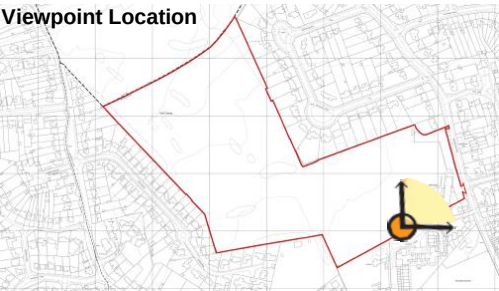
Location 3 (south facing) Description: view from corner opposite Brooklyn Drive beneath veteran oak, looking south towards Emmer Green primary school. 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: distant Emmer Green primary school amenity lighting, residential amenity/security lighting from properties along Gorselands and Eric Avenue, distant LED street lighting along Grove Road beyond primary school and along Eric Avenue. <u>Light Spill, Glare and Sky glow</u>: Glare from LED street lighting on Grove Road and Eric Avenue. Prominent sky glow to south. <u>Screening</u>: mature vegetation within Application site and along south west corner boundary. <u>Primary Receptors</u>: potential roosting and foraging bats. Viewpoint Location 
Location 4 Description: view from north east corner, looking west to north west 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: distant residential amenity/security lighting along Gorselands, Eric Avenue and Highdown Hill Road. Distant LED street lighting along Eric Avenue. <u>Light Spill, Glare and Sky glow</u>: Glare from LED street lighting along Eric Avenue. Sky glow to south and south west of site. <u>Screening</u>: dense vegetation in north east corner. Heavy screening from residential properties in south due to vegetation on site and along boundary. Partial screening of residential properties along Eric Avenue and Highdown Hill Road. <u>Primary Receptors</u>: Foraging bats. Viewpoint Location 

Location 5 (east facing) Description: view from the northern boundary, looking east to properties along Brooklyn Drive. 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: residential amenity/security lighting from dwellings on Brooklyn Drive. <u>Light Spill, Glare and Sky glow</u>: minor glare from residential lighting. <u>Screening</u>: partial screening from vegetation along eastern boundary. <u>Primary Receptors</u>: Foraging bats. Viewpoint Location 
Location 5 (south west facing) Description: view from the northern boundary, looking south west towards Eric Avenue. 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: distant amenity/security lighting from residential properties along Eric Avenue and Gorselands. <u>Light Spill, Glare and Sky glow</u>: minor glare from some residential amenity/security lighting. Minor sky glow visible in south. <u>Screening</u>: mature vegetation along northern part of Eric Avenue, sparser further south. Some vegetation within the site provides partial screening of properties on Gorselands. <u>Primary Receptors</u>: Potential roosting and foraging bats. Viewpoint Location 

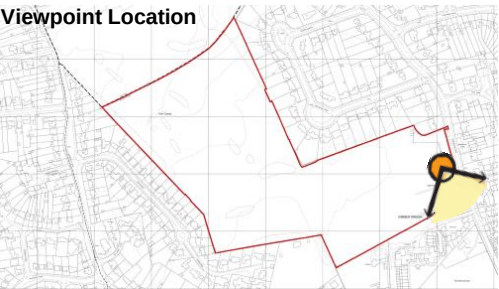
Location 6 Description: view from north west corner of Application Site, looking along the western boundary. 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: amenity/security lighting from residential properties along Eric Avenue and Highdown Hill road. <u>Light Spill, Glare and Sky glow</u>: none visible <u>Screening</u>: good screening from mature vegetation along western boundary, however, it is patchy in places <u>Primary Receptors</u>: Potential roosting and foraging bats. Viewpoint Location 
Location 7 Description: view from the western boundary, looking towards properties on Eric Avenue and Gorselands in the south west corner. 	Qualitative Description of Existing Lighting <u>Principle Light Sources</u>: amenity/security lighting from residential properties on Eric Avenue and Gorselands. LED street lighting also visible from these roads. <u>Light Spill, Glare and Sky glow</u>: Minor glare from LED street lighting along Eric Avenue and Gorselands. <u>Screening</u>: mature vegetation along western boundary provides partial screening. Very minor sky glow observed. <u>Primary Receptors</u>: Potential roosting and foraging bats. Viewpoint Location 

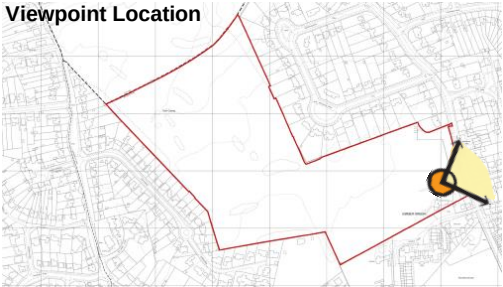
Location 8 Description: view from the southern boundary, looking towards Emmer Green Primary School in the south. 	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> amenity lighting from Emmer Green primary school. Distant LED street lighting visible from Grove Road beyond the primary school. <u>Light Spill, Glare and Sky glow:</u> Glare from Emmer Green primary school amenity/security lighting. Glare from LED street lighting on Grove Road. <u>Screening:</u> mature vegetation in south west corner, sparser along southern boundary. <u>Primary Receptors:</u> Potential roosting and foraging bats. Viewpoint Location 
Location 9 Description: view from the southern boundary, looking towards RGC clubhouse and residential dwelling. 	Qualitative Description of Existing Lighting <u>Principle Light Sources:</u> Amenity/security lighting from RGC clubhouse and adjacent dwelling. Bollard lighting from adjacent RGC car park. Distant amenity/security lighting visible from residential properties Kidmore End Road. LED street lighting also visible from Kidmore End Road. <u>Light Spill, Glare and Sky glow:</u> Distant glare from street lighting along Kidmore End Road. Glare from bollards in RGC car park. <u>Screening:</u> sparse vegetation along southern boundary provides some screening from Lyefield complex. Hedgerow provides some screening from Kidmore End road. <u>Primary Receptors:</u> residents of Kidmore End Road, resident of adjacent dwelling, road users of Kidmore End Road and foraging bats. Viewpoint Location 

Location 10 Description: view from the south east corner adjacent to the RGC clubhouse, looking towards RGC clubhouse and residential dwelling.	Qualitative Description of Existing Lighting <u>Principle Light Sources</u> : amenity/security lighting from RGC clubhouse and adjacent dwelling. Bollard lighting from RGC adjacent car park. Distant amenity/security lighting visible from residential properties Kidmore End Road. <u>Light Spill, Glare and Sky glow</u> : Glare from bollards in RGC clubhouse parking lot. Minor light spill from amenity lighting from RGC clubhouse. <u>Screening</u> : no vegetation screening RGC clubhouse and adjacent dwelling. <u>Primary Receptors</u> : resident of adjacent dwelling, foraging bats.
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Location 11 (entrance) Description: view from the RGC car park, looking towards bollard lighting.	Qualitative Description of Existing Lighting <u>Principle Light Sources</u> : bollard lighting in car park, amenity/security lighting from RGC clubhouse. <u>Light Spill, Glare and Sky glow</u> : Minor glare from bollards. Light spill from amenity lighting from RGC clubhouse. <u>Screening</u> : mature hedgerow (not in photograph) screens bollards from Kidmore End Road and properties. <u>Primary Receptors</u> : residents along Kidmore End Road, road users on Kidmore End Road.
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Location 11 (Kidmore End Road) Description: view from the RGC car park, looking towards residential properties on Kidmore End Road.	Qualitative Description of Existing Lighting
	<u>Principle Light Sources</u>: amenity/security lighting from properties along Kidmore End Road, LED street lighting along Kidmore End Road Car headlights also visible through hedgerow. <u>Light Spill, Glare and Sky glow</u>: Minor glare from LED streetlights and passing cars. <u>Screening</u>: mature hedgerow partially screens Application Site. <u>Primary Receptors</u>: Residents and road users of Kidmore End Road. Viewpoint Location 

Appendix F ILP Lighting Specification

Table D.1: Obtrusive Light Limitations for Exterior Lighting Installations – General Observers

Environmental Zone	Sky Glow Maximum values of upward light ratio (ULR) [URL/%] (1)	Maximum values of vertical illuminance on properties Illuminance in the vertical plane (Ev) [Lux]		Maximum permitted values of average surface Luminance(cd/m ²) (2)	
		Pre Curfew	Post Curfew	Building façade luminance	Sign luminance
E0	0	n/a	n/a	<0.1	<0.1
E1	0	2	<0.1*	<0.1	50
E2	2.5	5	1	5	400
E3	5.0	10	2	10	800
E4	15	25	5	25	1,000**

Definitions

ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux for that goes directly into the sky.

Ev = Vertical Illuminance in Lux and is measured flat on the glazing at the centre of the window

L = Luminance in Candelas per Square Metre Cd/m²

Curfew = The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local planning authority.

(1) This does not take into account the effect of light reflected upwards from ground that also contributes to sky glow. This is the traditional method to limit sky glow and is suitable to compare different single luminaires.

(2) The values apply to both pre- and post-curfew, except that in zones 0 and 1 the values shall be zero post curfew. The values for signs do not apply to signs for traffic control purposes

* If the installation is for public (road) lighting then this may be up to 1 lx.

***This figure has been amended to correct the decimal noted in the guidance document

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Table D.2: Obtrusive Light Limitations for Exterior Lighting Installations (Upward Flux Ratio) – General Observer

Environmental Zone	Type of Installation		
	Road	Amenity	Sport
E0	n/a	n/a	n/a
E1	2	n/a	n/a
E2	5	6	2
E3	8	12	6
E4	12	35	15
This table allows the effect of both direct and reflected upward components of a whole installation to be taken into account. The factor being the upward flux ratio (UFR) and CIE 150 suggests that table 7 is used for all installations consisting of four or more luminaires. Clauses 6.4.2 and 6.4.3 of CIE 150:2017 describe the calculation methods for both ULP and UFR. Light emitted just above the horizontal in a zone between 90° and 110° is extra critical for sky glow in large open areas around observatories An additional measure in these areas limits the luminous intensities ($I_{90} - I_{110}$) as follows: • between 90° and 100° < 0.5 cd/1000lm; • between 100° and 110° 0 cd.			

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Table D.3: Obtrusive Light Limitation for Exterior Lighting Installations – Limits for the Luminous Intensity of Bright Luminaires - General Observer

Light technical parameter	Application Conditions	Luminaire group (projected area A_p in m ²)					
		$0 < A_p \leq 0.002$	$0.002 < A_p \leq 0.01$	$0.01 < A_p \leq 0.03$	$0.03 < A_p \leq 0.13$	$0.13 < A_p \leq 0.50$	$A_p \geq 0.5$
Maximum luminous intensity emitted by luminaire (I in cd)	E0						
	Pre-Curfew	0	0	0	0	0	0
	Post Curfew	0	0	0	0	0	0
	E1						
	Pre-Curfew	$0.29 d$	$0.63 d$	$1.3 d$	$2.5 d$	$5.1 d$	2,500
	Post Curfew	0	0	0	0	0	0
	E2						
	Pre-Curfew	$0.57 d$	$1.3 d$	$2.5 d$	$5.0 d$	$10.0 d$	7,500
	Post Curfew	$0.29 d$	$0.63 d$	$1.3 d$	$2.5 d$	$5.1 d$	500
	E3						
	Pre-Curfew	$0.86 d$	$1.9 d$	$3.8 d$	$7.5 d$	$15 d$	10,000*
	Post Curfew	$0.29 d$	$0.63 d$	$1.3 d$	$2.5 d$	$5.1 d$	1,000
	E4						
	Pre-Curfew	$1.4 d$	$3.1 d$	$6.3 d$	$13 d$	$26 d$	25,000
	Post Curfew	$0.29 d$	$0.63 d$	$1.3 d$	$2.5 d$	$5.1 d$	2,500
Aid to gauging A_p		2 to 5cm	5 to 10cm	10 to 20cm	20 to 40cm	40 to 80cm	>80cm
Geometric mean of diameter (cm)		3.2	7.1	14.1	26.3	56.6	>80
Corresponding A_p representative area (m²)		0.0008	0.004	0.016	0.063	0.251	>0.5

Notes:

1. d is the distance between the observer and the glare source in metres;
 2. A luminous intensity of 0 cd can only be realised by a luminaire with a complete cutoff in the designated directions;
 3. A_p is the apparent surface of the light source seen from the observer position
 4. For further information refer to Annex C of CIE 150
 5. Upper limits for each zone shall be taken as those with column $A_p > 0.5$
- *This figure has been amended to correct the decimal noted in the guidance document

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Table D.4: Obtrusive Light Limitation for Exterior Lighting Installations – Road Users

Road Classification (1)	Threshold Increment (TI)	Veiling Luminance (L_v) (2)
No road lighting	15% based on adaptation luminance of 0.1cd/m^2	0.037 cd/m^2
M6/M5	15% based on adaptation luminance of 1.0cd/m^2	0.23 cd/m^2
M4/M3	15% based on adaptation luminance of 2.0cd/m^2	0.40 cd/m^2
M2/M1	15% based on adaptation luminance of $.05\text{cd/m}^2$	0.84 cd/m^2
TI = The measure of disability glare (the reduction in visibility caused by intense light sources in the field of view) expressed as the percentage increase in contrast required between an object and its background for it to be seen equally well with a source of glare present. Note: Higher values of TI correspond to greater disability glare L_v = The luminance that would need to be superimposed on a scene in object space to reduce the scene's contrast by an amount equal to the added retinal illuminance from scattered light on the scene's retinal image. It is most commonly used to describe the contrast-reducing effect of a glare source in the field of view. (1) Road classifications as given in CIE 115:2010 (2) The veiling luminance values specified in this table are based upon on a permissible TI value of 15%		

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