



Addendum Report 1.0 to 88684-MTP-Bersted-290519-v1.0

Prepared for:

JCC Lighting Products Ltd

October 2019

Our reference:

88684-MTP-Bersted-291019-Addendum-v1.0

Location:

Innovation Centre,
Beeding Close,
Bersted
PO22 9TS



Document Issue Record

Location:	Innovation Centre, Beeding Close, Bersted PO22 9TS				
Application:	Erection of an industrial building, ancillary to the existing operations				
Prepared for:	JCC Lighting Products Ltd				
Title:	Addendum Report 1.0 to 88684-MTP-Bersted-290519-v1.0				
Project No.:	88684	Date:	29 th October 2019	Issue No.:	1.0
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1. Introduction

- 1.1. This report is an addendum to Flood Risk Assessment and Surface Water Drainage Strategy (88684-MTP-Bersted-290519-v1.0) and should be read in conjunction with the original strategy.
- 1.2. This addendum report has been prepared by Unda Consulting Limited on behalf of JCC Lighting Products Ltd, to address Planning Application Consultation Comments from Laura Gibbons (Drainage & Coastal Engineer at Arun District Council), dated 30th August 2019 and 23rd September 2019; respectively:

Regarding the levels, I also requested some spot levels of the surrounding land, can these be provided. This is fundamental to ensure that the surface water from the development does not go off site.

And;

Regarding the applicants question as to potential use of LiDAR- LiDAR could be used if it is demonstrated that there is a good correlation between LiDAR levels and the known cover level of the manhole. It may be that the LiDAR elevations aren't particularly accurate due to building shadow effects.

- 1.3. Planning application BE/139/18/PL is for the erection of a temporary industrial building, ancillary to the existing operations. The new industrial building is designed to be operational for three years and has introduced an additional 150m² of roof area to the site.
- 1.4. Laura Gibbons (Drainage & Coastal Engineer) has requested spot level information relating to the surrounding area in order to ensure that there is no increase in off-site runoff as a result of the development.
- 1.5. On the 23rd September 2019 Laura Gibbons agreed that Environment Agency LiDAR information could be utilised to determine whether post development surface water runoff may impact the surrounding area, on the provision that reported levels correlate to known spot heights.

2. Environment Agency LiDAR:

- 2.1. A topographical survey has not been undertaken at the site however, Environment Agency LiDAR information is available.
- 2.2. Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LIDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to +/-5cm to 15cm with spatial resolutions ranging from 25cm to 2 metres. This dataset is derived from a combination of the EA's full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LIDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model.
- 2.3. 0.5m horizontal resolution DTM LiDAR data has been used for the purposes of determining whether any post development surface water runoff may impact the surrounding area.

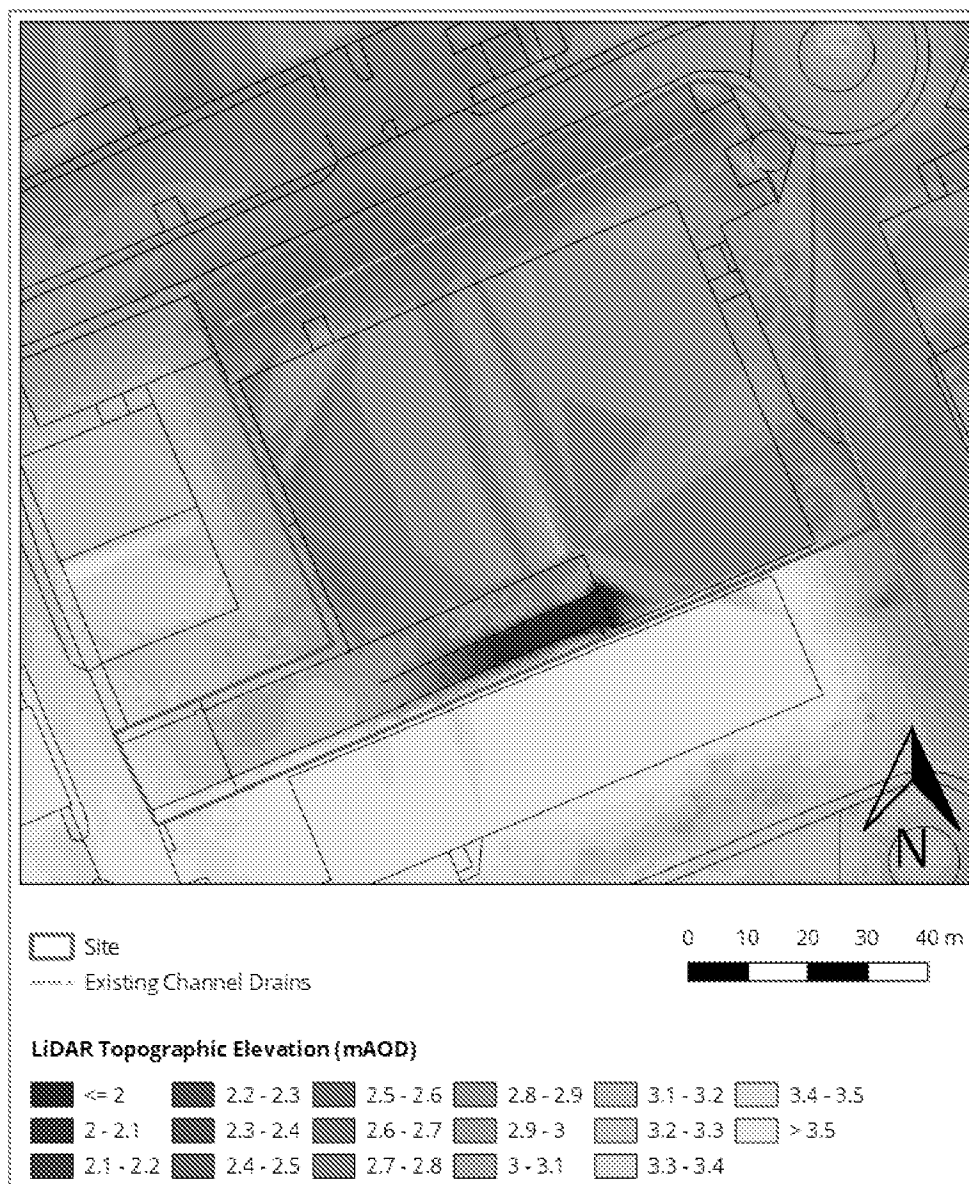


Figure 1: LiDAR Elevation Map (Source: OS, EA)

- 2.4. Data suggests that any surface water runoff in the north of the site, associated with the car park area, is currently directed towards and conveyed via an ACO drain to the existing Southern Water surface water network.
- 2.5. The main area of focus in this assessment is the east of the site, associated with land surrounding the new development. According to EA LiDAR information any overland runoff in the loading area, to the east of the main warehouse, would flow in an easterly direction towards a natural topographic depression located along the eastern periphery of the site.
- 2.6. Having reviewed documentation from a site visit, conducted on 13th May 2019, the topographic depression highlighted within EA data correlates to an existing channel drain which runs along the length of the eastern boundary and appears to convey water in a northerly direction (refer to Figure 2).



Figure 2: Channel Drain Located Along the Eastern Periphery of the Site (Source: Unda Consulting Limited)

- 2.7. According to LiDAR information the elevation profile of the neighbouring land, adjacent east and south of the site, slopes down towards the topographic depression along the eastern periphery JCC Lighting Product Ltd. This indicates that any offsite overland runoff would also naturally flow towards the aforementioned channel drain.
- 2.8. The Local Authority have raised concerns that any surface water runoff from the site may impact neighbouring land. In light of the information outlined above, it is considered that any surface water runoff from the east of the site would flow towards the existing channel drain where it would enter the existing surface water drainage network. The channel drain along the eastern boundary appears to be at a lower elevation than the surrounding area therefore data suggests that any overland runoff will not flow off site. Given this, there will be no increased flood risk to neighbouring properties as a result of the development.

3. Validation of EA LiDAR:

- 3.1. The Local Authority have requested that any EA LiDAR information used within this assessment is compared with known spot heights to validate the data's accuracy.
- 3.2. As part of the previous works for Flood Risk Assessment and Surface Water Drainage Strategy 88684-MTP-Bersted-290519-v1.0, enquiries were raised with Southern Water to ascertain detailed information relating to the existing sewer network in vicinity to the site.
- 3.3. As part of the results from the Asset Location Search, cover levels for both foul and surface water manholes have been provided by Southern Water.
- 3.4. The reported cover levels are considered to be representative of the elevation of land at each manhole point therefore, appropriate for comparison with the Environment Agency LiDAR information to determine data accuracy.
- 3.5. Utilising GIS software, the sewer map received from Southern Water as part of the Asset Location Search has been superimposed and geo-rectified onto the Environment Agency LiDAR layer using Ordnance Survey MasterMap as a base reference.
- 3.6. In total twenty-two known manhole cover levels have been compared to EA LiDAR data at the corresponding points. The results of this exercise are detailed within the table below:

Manhole Reference	Southern Water Cover Level (mAOD)	LiDAR Elevation (mAOD)	Difference (m)
2102	3.6	3.604	-0.004
2103	3.44	3.437	0.003
2104	3.31	3.362	-0.052
2105	3.44	3.589	-0.149
2151	3.67	3.667	0.003
2201	3.21	3.094	0.116
2202	3.42	3.394	0.026
2251	3.57	3.284	0.286
2252	2.87	2.922	-0.052
2351	3.13	3.144	-0.014
3151	3.76	3.779	-0.019
3152	3.36	3.389	-0.029
3201	2.7	2.544	0.156
3301	2.68	2.914	-0.234
3351	3.32	2.777	0.543
3352	2.64	2.664	-0.024
4251	3.09	2.984	0.106
4252	3.18	2.684	0.496
4351	2.96	2.997	-0.037
4352	2.88	2.722	0.158
4353	2.49	2.454	0.036
4355	3.01	2.974	0.036

Average Difference (m)

0.061409091

Table 1: Comparison of Manhole Cover Levels with Corresponding EA LiDAR Elevations (Source: EA, Southern Water)

- 3.7. Based on the table above, a comparison of twenty-two known ground level elevations (Southern Water cover levels) with corresponding EA LiDAR topographic points reveal that on average the EA LiDAR elevations are only 0.06m (6cm) greater than reported ground levels.
- 3.8. In light of these findings, the Environment Agency's 0.5m horizontal resolution DTM LiDAR data is considered representative of the elevation profile at the site and within the surrounding area.

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4. Conclusion:

- 4.1. This report is an addendum to Flood Risk Assessment and Surface Water Drainage Strategy (88684-MTP-Bersted-290519-v1.0) and should be read in conjunction with the original strategy.
- 4.2. This addendum report has been prepared by Unda Consulting Limited on behalf of JCC Lighting Products Ltd, to address Planning Application Consultation Comments from Laura Gibbons (Drainage & Coastal Engineer at Arun District Council) in relation to application BE/139/18/PL.
- 4.3. Laura Gibbons (Drainage & Coastal Engineer at Arun District Council) has requested spot level information relating to the surrounding area in order to ensure that there is no increase in off-site runoff as a result of the development. It was agreed that Environment Agency LiDAR information could be utilised to determine whether post development surface water runoff may impact the surrounding area, on the provision that reported levels correlate to known spot heights.
- 4.4. An analysis of Environment Agency 0.5m horizontal resolution DTM LiDAR data indicates that any surface water runoff from the east of the site would flow towards the existing channel drain where it would enter the existing Southern Water drainage network. The channel drain along the eastern boundary appears to be at a lower elevation than the surrounding land therefore data suggests that any overland runoff will not flow off site, thus there will be no increased flood risk to neighbouring properties as a result of the development.
- 4.5. The Local Authority have requested that any EA LiDAR information used within this assessment is compared with known spot heights to validate the data's accuracy.
- 4.6. Twenty-two known ground level elevations, taken from a Southern Water Asset Location Search, have been compared with corresponding EA LiDAR topographic points. This validation process revealed that on average EA LiDAR elevations are only 0.06m (6cm) greater than reported ground levels.
- 4.7. In light of these findings, the Environment Agency's 0.5m horizontal resolution DTM LiDAR data is considered representative of the elevation profile at the site and surrounding area.
- 4.8. Given this, Unda are confident that the EA LiDAR map shown in Figure 1 reflects the natural lay of the land in vicinity to JCC Lighting Products Ltd and post development surface water runoff will not impact the surrounding area.