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**Former B&Q Site, Great Stone Road, Stretford, M32 0YP**

**Appeal by Accrue (Forum) – 1LLP**

**LPA Ref: 100400/OUT/20**

**Appeal Ref: APP/Q4245/W/20/3258552**

Report Date: 14/12/2021

Lee Collier



## Introduction

- 1.1. My name is Lee Collier, and I provide expert evidence to this public inquiry on behalf of the Appellant, in relation to concerns raised in relation to the impact of proposed development on the natural turf training facility at the Emirates Old Trafford stadium.
- 1.2. I am the Principal Technical Consultant at STRI, which is a consultancy providing services to the Sport and leisure sectors in relation to turf design and management. STRI are a global sports surface facility planning, design, construction and consultancy specialist in the development of elite standard sports surfaces. We are recognised globally for setting the benchmark for success in the delivery of large scale, risk-free projects, utilising research backed, innovative design processes.
- 1.3. STRI services over 2,000 clients annually and has project managed and consulted at major events for a multitude of sports including Olympic games, major golf tournaments and international football competitions throughout the world.
- 1.4. I have over 15 years' experience as a design consultant in the global sport surface industry playing a key role in the technical delivery of STRI's major projects and I lead the STRI Group Design & Engineering team. I have a keen understanding of turfgrass requirements which involves a holistic overview of the architectural and climatic restrictions of each project. I hold FACTS Qualification, have a BA (Hons), and have worked as a specialist designer and consultant for 23 years including the design, development, and operation of turf research trials to determine the turfgrass strategy and design solution for FIFA World Cup 2022 in Qatar.
- 1.5. Other key projects include FCB Barcelona Nou Camp Stadium redevelopment, London 2012 Olympic stadium transformation to a football stadium, Wimbledon Centre Court, Samy Ofer stadium in Israel, New Zealand Cricket indoor training venue (including bespoke hemiview light analysis), Western Sydney Bankwest Stadium, among work for governing bodies delivering tournament specific sites. I have a particular expertise in assessing light impact in stadia and other structure in relation to turf management and have completed analysis for more than fifty sites across multiple sports including World Cup stadia in Russia and Qatar.
- 1.6. The appeal is made against the non-determination by the local planning authority of application ref. 100400/OUT/20 which proposes: "The demolition of existing retail unit and associated structures; erection of buildings for a mix of use including: 333 apartments (use class C3) and communal spaces ancillary to the residential use; flexible space for use classes A1, A3, D1 and/or D2; undercroft car parking; new public realm; and associated engineering works and infrastructure."
- 1.7. The description of development has subsequently changed to reflect the fact that there are 332 apartments shown on the drawings. This does not affect the massing of the proposal.
- 1.8. My evidence relates to the following Main Consideration as identified by the Inspector at the Case Management Conference held in November 2021:  
*The effect of the proposed development on the fine turf and non-turf training facility at Lancashire County Cricket Club.*
- 1.9. This Consideration relates to the following Putative Reason for Refusal, which I am instructed as been identified by the local planning au:

*The proposed development would prejudice the use of the turf and non-turf training facility at Lancashire Cricket Club. The proposed development therefore conflicts with Strategic Objective OTO11, Policies SL3 and R6 of the adopted Core Strategy.*

- 1.10 The LPA has since confirmed to WSP (ref: email from Debra Harrison to Matthew Hard., 17 November) that the issue relates to the potential impact on the turf facility (in other words, that there is no impact on the non-turf elements).
- 1.11 My evidence presents a holistic review which assesses how the architectural design of the proposed development will affect the light reaching the fine-turf training facility, since this is fundamental in determining whether the fine-turf facility would be adversely affected by the proposed development.
- 1.12 My conclusion, set out below, is that I do not consider that the proposed development will have such adverse impact. In reaching this conclusion, I have had regard to the following representations:
- LPA Statement of Case (CD- F68)
  - Sport England representations (August 2020) (CD- F92)
  - Sport England consultation comments (31 July 2020 and 17 July) (Appendices 2 and 3 of Sport England representations) (CD-F97)
  - England and Wales Cricket Board (ECB) Covering Letter (Appendix 4a of the Sport England representations) (CD-F97)
  - ECB Technical Report prepared by Dr Iain James (Appendix 4b of the Sport England representations) (CD- F97)
  - Lancaster County Cricket Club (LCCC) representations (CD-F94)
  - LCCC Statement of Case (CD-F98)

## 2.0 Response to Sport England representations

2.1 *I have considered the Sport England Representations document, Appendix 4A prepared by Dr Ian James and in the paragraphs below I provide summary responses in respect of each paragraph.*

2.2 *Extract from Sport England Representations Appendix 4A Page 61 paragraph 1 ‘The evidence provided by the appellant (report by STRI) demonstrates there is an impact of reduced light in critical winter months for fine turf renovation’*

2.2.1 I have noted repeated references to fine turf renovation which infers the natural grass practice wickets are based on fine fescue and bents species which would typically be used on areas such as golf and bowling greens. Cricket squares and practice wickets are now developed using hard wearing *Lolium perenne* (Perennial Ryegrass) cultivars adapted to close mowing and this is confirmed within the Ian James report (Paragraph 3 on page 2).

2.2.2 On that basis within this document, I will discuss the requirements for *Lolium perenne* (Perennial Ryegrass) specifically. The typical requirements for active growth in *Lolium perenne* (Perennial Ryegrass) are included in the table below for reference:

Parameter	Lower-level limited range for active growth	Optimum range for active growth
Solar radiation (DLI)	6 to 8 mol/m <sup>2</sup> /day [1]	8-30 mol/m <sup>2</sup> /day
Soil Temperature for root growth	5-10 °C	10-20 °C
Air Temperature for Shoot growth	10-15 °C	15-25°C
Relative Humidity	< 40 % at 25 °C	40 to 65 % at 25 °C
Airflow at plant level (ventilation & drying function)		Uniform 6-8 km/hr (1.6 - 2.2 m/s)

Table 1: The data above is derived from research trials in the UK, See also (Newell, A. J. (2000) *Stadia Design Where the sun doesn't shine*; Newell, A. J., Hart-Woods, J. C. and Wood, A. D. (1999), *Journal of Turfgrass Science*, vol. 75,)

[1] mol/m<sup>2</sup>/day is the measure of photosynthetically active radiation relative to plant growth

- 2.2.3 As you will note, in the context of the parameters outlined on the previous page, light levels and temperatures both with and without the apartment development fall below the lower-level limited range for active growth for *Lolium perenne* (Perennial Ryegrass) and would therefore provide sub optimal growing conditions. It should also be noted that any reduction in light levels caused by the apartment development is considered minimal and will not significantly change conditions for turf renovation during the winter months.
- 2.2 *Extract from Sport England Representations Appendix 4A Page 61 paragraph 2 'The appellants evidence neglects the impact of temperature reduction (which correlates directly to lack of light) and also introduces irrelevant scenarios relating to the temporary stand (which is demonstrated to have no impact in summer months and is never erected in winter as cricket is not played)'***
- 2.2.4 The Hemi-view [1] report (Ref: [WSP to provide ref]) is primarily an assessment of light availability on the area affected by the proposed development, rather than correlate any changes in temperature which may be a consequence of this. Whilst there is reference in the ECB report to the potential impact of reduced temperatures on grass growth this is inferred and not substantiated with any supportive data.
- 2.2.5 We should be careful not to overstate the potential impact of light on temperature, especially given the clearness index in Manchester which ranges from 27-30% over the winter months. Reviewing climate temperature data based on the typical requirements for active growth in *Lolium perenne* (Perennial Ryegrass) provided in table 1 show that ambient temperatures are sub optimal for active grass growth for the period in question.
- 2.2.6 In relation to light levels and temperature, the hemiview analysis has demonstrated that any reduction is not significant and therefore it is likely that the impact on temperature will correlate, especially when clearness is factored in. On that basis, any reduction in temperatures caused by the apartment development is also likely to be considered minimal and will not significantly change conditions for turf management or renovation during the winter months.
- 2.2.7 Nevertheless, it should be noted that there are numerous references to temperature contained within the original report, so the impact of temperature in relation to active growth for *Lolium perenne* (Perennial Ryegrass) has not been neglected.

*[1] Hemiview is a proprietary software developed by Delta-T to determine the amount of direct and diffuse solar radiation reaching a surface whilst considering obstructions which reduce light reaching that surface. The hemiview carried out in the context of this report is aimed at quantifying the amount*

of light reaching the surface of the cricket training area both with and without the apartment development.

**2.3 *Extract from Sport England Representations Appendix 4A Page 61 paragraph 3 'ECB believe there is a significant risk of impairment to the fine turf practice facility (by overshadowing) and it would be essential that this is mitigated by the introduction of growth lights'***

2.3.1 Light levels and ambient temperatures from November to January both with and without the apartment development are below the threshold for active growth as defined in table 1. On that basis the requirement for supplementary grow lights is the same as the present situation. As noted in section 2.2 and 2.3 Any reduction in light levels and temperature caused by the apartment development is considered minimal and will not significantly change conditions for turf management or renovations during the winter months.

**2.4 *Extract from Sport England Representations Appendix 4A Page 63 paragraph 6 'The challenge for any cricket grounds manager is to establish grass in this late autumn/early winter period and then to sustain that through winter dormancy to then encourage growth as early as possible in the February-March period in preparation for the start of training in March'***

2.4.1 Based on the hemiview and an interrogation of climate data between November and January there will be minimal active grass growth to assist the restoration of the nets area, with or without the proposed new development.

2.4.2 During February, the shading is again only transitory [2] over the southern portion of the facility and lasts for a period of approximately 4 hours between mid-morning and early afternoon and impacts only the southernmost margin of the nets area. The hemiview study indicated that average daily light integral (DLI) are above the threshold for active growth in February.

2.4.3 There is no shading effect from the new development at all during the month of March, as confirmed by the shade track video and Hemi-view analysis.

2.4.4 [2] *Transitory shade moves through out the day based on the solar track, it does not impact overall daily light integral (DLI) which is the cumulative sum measure in mol/m<sup>2</sup>/day.*

2.5 **Extract from Sport England Representations Appendix 4A Page 63 paragraph 7 'There is a reduction in the quantum of photosynthetically active radiation (PAR) received by the plant (as described in the STRI report)'**

2.5.1 The Hemi-view analysis indicates that currently, the southern section of the training facility is receiving between 4 – 5 mol/m<sup>2</sup>/day during December through until January, which is below the levels required to support active grass growth. Therefore, under the existing scenario, supplementary lighting would theoretically be required to provide lighting conditions suitable for active grass growth through the winter period, i.e. between 6-8 mol/m<sup>2</sup>/day. This is confirmed in the report with the illustration of how many lighting rigs would be required to achieve these optimum conditions and their deployment over the net areas during this period (Figure 14: Scenario 2).

2.5.2 My analysis demonstrates that in the event the proposed scheme of development was built out, the light level range between November and January would be between 3 – 5 mol/m<sup>2</sup>/day, with the lowest levels showing across the southern portion of the practice nets area.

2.5.3 I consider that such a minor reduction would be very unlikely to have a significant impact during winter months when the grasses would normally be in a relatively inactive state because of low ambient light levels and temperatures as explained in section 2.2 and 2.3. As such I do not agree that the concerns expressed are well-founded.

2.6 **Extract from Sport England Representations Appendix 4A Page 63 paragraph 7 'There is a reduction in temperature of the microclimate and a delay in thawing of frost'**

As the shading caused by the proposed development is transitory, the western half of the training area block shows minimal shading in the first half of the morning, with some shade during midday, before it clears again in the afternoon. The temperature of the immediate microclimate can be mitigated

through the use of frost protection / germination sheets, which is common practice when managing turf establishment and which the club already appear to commonly employ (as illustrated on google

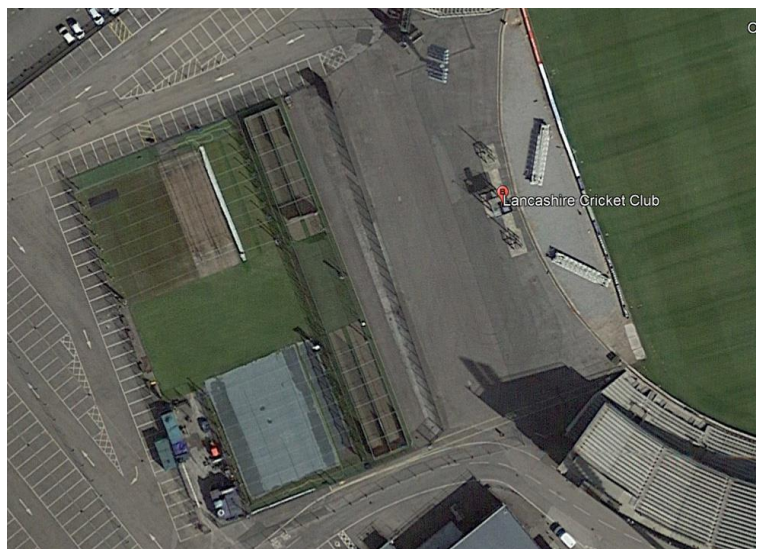


Fig 1 – Google aerial illustrating Old Trafford's use of germination sheets

earth images of the site, shown at Fig 1). Refer to Appendix 1 which states “before a germination sheet was placed on top”.

**2.7 Extract from Sport England Representations Appendix 4A Page 64 paragraph 1 ‘The reduction in temperature also reduces evaporation meaning that the perennial ryegrass sward will take longer to dry encouraging disease and sustaining colder roots within the predominantly clay soil used for the cricket playing surface’**

2.7.1 The shading animation videos (appendix 2 and CD-13) provided indicates that the shadowing does not encroach onto the net areas until around 9:10 am and finishes by early afternoon throughout March. The transitory nature of the shadowing is such that any impact on thawing of the turf following frosting will be minimal. When heavy frosting is forecast, then any temperature reductions could be mitigated through the use of frost protection covers, as required.

2.7.2 There is no supporting information to substantiate, the reported reduction in temperature and evaporation which would have sufficient impact on grass establishment and recovery. In any case, during winter months it is good turf management practice to remove morning moisture by switching, local temperature variation would mean such practice would be required in any case.

**2.8 Extract from Sport England Representations Appendix 4A Page 64 paragraph 1 ‘At this time of year, the temporary stand is not in place and therefore consideration of shade from the temporary stand is not relevant’**

2.8.1 Whilst the construction of the temporary stand does not influence the autumn renovation programme, its presence is significant in that on previous occasions, the stand has extended over the eastern margin of the net facility, straddling the two non-turf wickets. Whilst in place, the stand will cause extensive shading of the nets during the morning period and into the early afternoon.

2.8.2 This will lead to similar conditions for users of the facilities, as referred to in the Sport England Representations report (Page 58, 3(b)) which states that ‘*The current snapshot analysis shows that in September it will cause a contrast between the batters and bowlers making the ball difficult to see.*’

2.8.3 At this time, the analysis indicates that there will be transitory shading extending across the south-western corner of the facility for a period of around 3 hours in the morning, this only affecting the southern margin of the nets. Differential light conditions only occur in an isolated area for a short period of time.



**2.9 Extract from Sport England Representations Appendix 4A Page 64 paragraph 2 ‘Figure 1 is a side-by-side comparison of data from the STRI report for the critical months of October and February. The effect of increased shade can be seen by lower quantities of PAR in both months in Scenario 2 at the southern end of the net facility where critical high wear areas exist; however, the impact of this on grass establishment, and any temperature effects are not considered by the STRI report’.**

2.9.1 The Hemi-view analysis is principally a light assessment, but it is acknowledged in my report that other factors are involved including temperature, humidity and air movement. However, even with a 1 mol reduction during February and October, DLI still above the minimum optimum level for *Lolium perenne* (Perennial Ryegrass) at these times of year and therefore any therefore impact on grass growth will be minimal. Indeed, any resumption of grass growth is unlikely to occur until March when there is very minor shading impact on the facility. See figures 2 & 3.

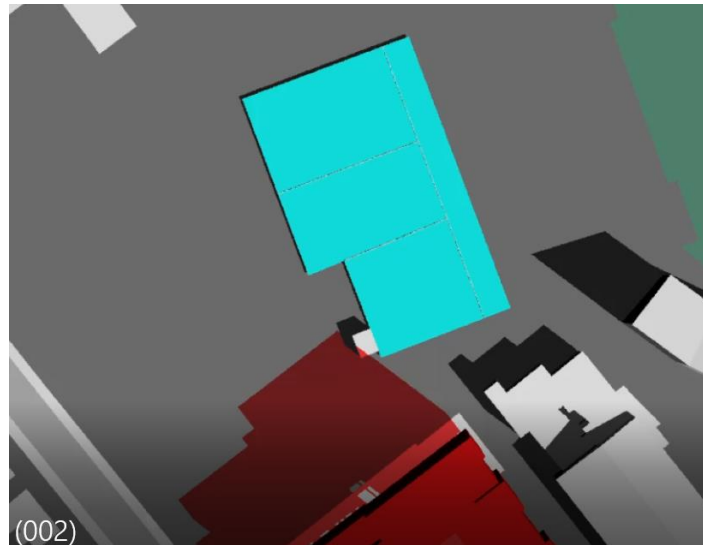


Fig 2 – OTC overshadowing @ 31.03.2022 09:10AM

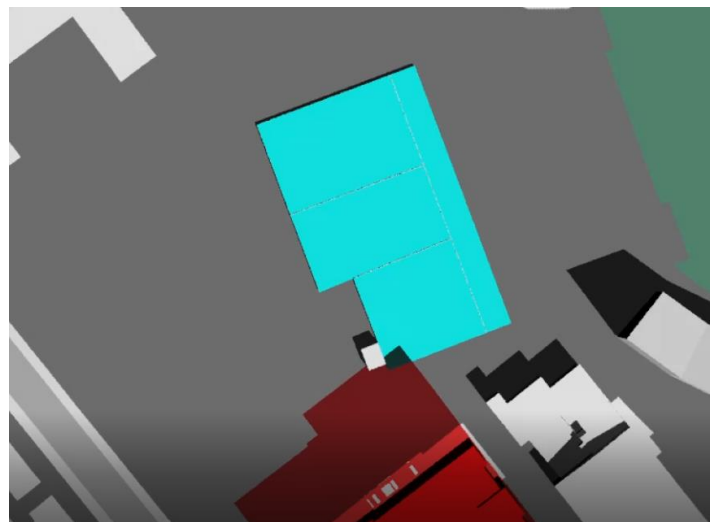


Fig 3 – OTC overshadowing @ 31.03.2022 10:10AM

- 3.0** *Extract from Sport England Representations Appendix 4A Page 64 paragraph 3 'A combination of trying to germinate, establish and develop perennial ryegrass at that time of year in preparation for intensive wear in early spring, the heavy clay soil and the wetter climate of the Old Trafford location mean that all marginal impacts on light and temperature can have significant effects on the performance of the surface and in particular when it can be used'*
- 3.01 The hemiview analysis has indicated that the greatest shading affects from the proposed new buildings are during December and January to a lesser extent to the south-eastern end of the facility in February and November. There would be a limited amount of work which can be undertaken during February to assist the recovery of the repaired net areas until the prevailing ground and air temperatures improve.
- 3.02 During February the only shading occurring is transitional and limited across the southern margin of the nets, with the northern nets being unaffected. The DLI is above the level required. The main shading occurs during November through until January when there would normally be limited active growth potential during this period due to low temperature and ambient light levels conditions therefore there would only be minimal opportunity to enhance the restoration of any worn sections.
- 3.03 In the more critical month of October, when the main renovation works are taking place, the overall light level reduction is 1 mol/m<sup>2</sup>/day which means the available light levels is still above the required level and therefore will not have a significant impact on establishment post renovation.
- 3.1** *Extract from Sport England Representations Appendix 4A Page 64 paragraph 4 'Mitigation of this type would incur significant cost. A standard growth light rig suitable for this area would be approximately £32,500 +VAT and could be ca. £50,000 +VAT for a modified one-off design to reduce damage by wheeling the light rig across soft wet soils in the winter period'*
- 3.1.1 The Hemi-view analysis indicates that the need for supplementary lighting caused by the impact of any additional shading would not justify the cost of buying lighting rigs. Indeed, the analysis demonstrates that even **without** the proposed development, the light levels over the facility are below the minimal threshold for active growth between November and January. Therefore, under the current conditions, any form of close season recovery of the turf could not be expected during these months in any event.
- 3.1.2 With the proposed development in place, the need for additional supplementary lighting to achieve optimum conditions is suggested by ECB between November and January, but also, across the southern margin of the facility during February. However, where additional supplementary light is

shown, the additional number of deployment days required above those shown for the current site is only between one to two days within each of these months. Again, these predictions are based on achieving optimum lighting conditions which are not being reached currently over the practice nets area during the winter period.

3.1.3 In my professional view, the difference between the existing conditions and the conditions that would occur as a result of the proposed development is inconsequential and does not significantly change conditions for active turf growth related to renovation of the natural turf practice area.

3.1.3 Analysis shows that DLI both with and without the proposed development are below the required threshold DLI over the winter months. On that basis conditions for renovations have not changed, and the argument for the inclusion supplementary grow lighting is unfounded.

**3.2 *Extract from Sport England Representations Appendix 4A Page 64 paragraph 5 'The lighting rig would need to be moved and operated. Operating costs of 100 person-hours/year at £100 /hour would total £10,000 /year. With an operating demand of approx. 25 kW (£3.63 /hr @14.5 p/kWh indicative, and a greenhouse gas emission of 5.3 kg CO<sub>2</sub>e/hr over 8 hours a day for the same 100-day period, electricity costs would total £2,904 /year and at a median offsetting cost of £80/t CO<sub>2</sub>e, offsetting would require £339 / year. This is a total operating expenditure of £10,787 / year'***

3.2.1 My Hemiview analysis indicates that without the proposed development lighting rigs would be required over the winter phase to reach light levels for active growth in *Lolium perenne* (Perennial Ryegrass). The analysis also indicates that the impact of any increased shading caused by the apartments would result in an increase of between 1 and 2 additional days of deployment of the rigs between November and February and therefore the potential operational costs would be relatively low. The figures quoted above are unsubstantiated, the SE evidence does not provide actual deployment time based on DLI deficit in order to accurately determine running and operational costs.

3.2.2 Nonetheless, in any event I would again strongly refute the suggestion that the proposed development will create conditions whereby lighting rigs are needed.

- 3.3** *'Sport England representations Page 58 – 'The current snapshot analysis shows that in September it will cause a contrast between the batters and bowlers making the ball difficult to see'*
- 3.3.1 The effect of this is transitory only affecting the southern strips and there is likely greater impact during the summer months from the temporary stand which extends over the eastern edge of the training facility and will cast shadows over this in the mornings and early afternoon.
- 3.4** *'5.10 LCCC also considers the Appeal Proposal by reason of its scale and massing and proximity to the training facility will be prejudicial to the use of the training facility by elite cricket teams by reason of overlooking/ loss of privacy and security. The Appellant has provided no suggested mitigation to address the security and operational issues associated with the fine turf training facility. Indeed, this area is used by international cricketers, who require the ability to train in privacy whilst experiencing outdoor match conditions. The development proposal would significantly compromise this' (LCCC Statement of Case, CD-F98)*
- 3.4.1 Whilst the sections of the proposed new development will overlook the practice nets facility, this will be no different from other international venues such as the Nursery Ground facility at Lord's which is visible from numerous apartment blocks which surround the venue (see attached photo from Rightmove for apartment overlooking the nursery ground).
- 3.4.2 I also suspect that there will be existing views into the training facility from the Lancastrian House office building.



Fig 4 – Nursery grounds facility at Lords

### 3.5 **Conclusions:**

- 3.5.1 The existing conditions relating to DLI and temperature during critical winter months from November through to January are below the threshold for active growth in *Lolium perenne* (Perennial Ryegrass).
- 3.5.2 The proposed development will provide only a very minor reduction in DLI and temperature during critical winter months from November through to January which will not significantly change potential for active growth in *Lolium perenne* (Perennial Ryegrass) or change requirements for maintenance through this phase.
- 3.5.3 In my professional view, the overall extent of change is insignificant. Therefore in my professional judgement the development will not cause any prejudice to the ongoing use of the natural turf practice area.