

**Daylight & Sunlight Assessments of a
Proposed Strategic Housing Development on lands at
Santa Sabina Dominican College and Convent Complex,
Greenfield Road, Sutton, Dublin 13.**

Applicant: Parsis Ltd.
Date: March 2020

Prepared by John Healy
MSc Environmental Design of Buildings

1. Introduction

Status of Permitted Development

In November 2018, Parsis Ltd. received planning permission from Fingal County Council (Reg. Ref.: F17A/0615) for a residential development of 96 no. dwelling units, a crèche, access to the proposed development and a new access to the Santa Sabina Dominican College & Convent Complex, on a c. 2.46 hectare site off Greenfield Road, Sutton, Dublin 13.

Works for the provision of the new entrance and revised access to the college and convent complex, together with associated surface water attenuation and infrastructure works, commenced in February 2019. The new entrance and revised access were opened in summer 2019 and associated works were completed in late 2019.

Construction works associated with the permitted residential scheme are currently on-going on site and include tree protection measures; establishment of site compound, site stripping, topsoil storage, provision of a second surface water attenuation tank and associated services; construction of site access, which utilises the route of the permitted development access road, and excavation of the permitted basement located under Apartment Blocks A-B1, B2-B3, C1 & C2.

Summary of the Proposed Development

As set out in the public notices, Parsis Ltd, are now applying for planning permission through the Strategic Housing Development process for alterations to the permitted residential development. The proposed alterations relate to a c. 0.76 hectare portion of the overall application site of c. 2.46 ha. The remainder of the development is being constructed in accordance with the existing permission, Reg. Ref.: F17A/0615.

The proposed alterations to the permitted development relate to 102 no. residential units, including the provision of 47 no. additional residential units and alterations / redesign of 55 no. permitted residential units, which results in an increase in the total number of residential units on the site from 96 to 143.

The proposed alterations to the permitted development are located entirely on lands zoned RS- Residential.

No alterations are proposed to Block B2-B3 (24 no. units) and C2 (17 no. units), which contain a total of 41 no. permitted apartments and a creche, or that portion of the basement located below these blocks. Likewise, no changes are proposed to the previously permitted public open spaces and play areas located to the south and east of the development.

This analysis is carried out based on the drawings of O'Mahony Pike Architects. The results find that there will be good quality light in the apartments analysed. There would be no impact on the amenity of the adjacent properties. The proposed development meets the recommendations of the BRE guidelines.

2. Methodology

2.1 Notes on the use of BS 8026-2 2008 and BRE guidance document (2011) “Site layout planning for daylight and sunlight”.

To date, it is understood that no standards or guidance documents (statutory or otherwise) on the subject of sunlight access to buildings or open spaces or daylight access to buildings have been prepared or published in Ireland. Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities 2018 directs Planning authorities to have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide ‘Site Layout Planning for Daylight and Sunlight’ (2nd edition) or British Standard BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’. The standards for daylight and sunlight access in buildings (and the methodologies for assessment of same) suggested in both of these documents have been referenced in this Sunlight and Daylight Access Analysis.

Neither the British Standard nor the BRE Guide set out rigid standards or limits. The BRE Guide is preceded by the following very clear warning as to how the design advice contained therein should be used:

“The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aims is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design.”

That the recommendations of the BRE Guide are not suitable for rigid application to all developments in all contexts is of particular importance in the context of national and local policies for the consolidation and densification of urban areas. Given that the British Standard and the BRE Guide was drafted in the UK in the context of UK strategic planning policy, recommendations or advices provided in either document that have the potential to conflict with Irish statutory planning policy have been disregarded for the purposes of this analysis.

2.2 Daylight to the existing dwellings

The site is analysed in plan & section, and building use. Windows and amenity area are selected to test for impact from the proposed development.

BRE guideline recommends that: “Loss of light to existing windows need not be assessed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window.”

“To check for this if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse light of the existing building may be adversely affected.” If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.

For loss of daylight and sunlight to existing buildings BRE guidance document (2011) “Site layout planning for daylight and sunlight” is used and BS8208 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

For loss of light the report recommends calculation of the Vertical Sky Component. This is the ratio of direct sky illuminance falling on the outside window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE Overcast Sky is used and the ratio is usually expressed as a percentage. The maximum value is just under 40% for a completely unobstructed vertical wall. The vertical sky component on a window is a good measure of the amount of daylight entering it.

The BRE guidelines set out a two stage guide for the vertical sky component:

- a) Where the Vertical Sky component at the centre of the existing window exceeds 27% with the new development in place then enough sky light should still be reached by the existing window.
- b) Where the vertical sky component with the new development in place is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy, and electric light will be needed more of the time.

2.3 Sunlight to gardens and open spaces

For calculations of sunlight analysis it is general practice to use March 21 and the recommendations of the BRE guidance document (2011) "Site layout planning for daylight and sunlight". P.J Littlefair, in relation to Gardens and open spaces section 3.3.17 state:

"It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."

The BRE Guidance document recommends "To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south."

2.4 Daylight in the proposed development.

The proposed project is analysed in plan & section, and building use. The rooms judged to have the potential for the lowest levels of daylight are selected as worst case scenarios and assessed for Average Daylight Factor (ADF).

3. Daylight to Existing Adjacent Properties



Figure 1. Aerial view of site.

The site is an active construction site, where enabling works and basement construction are being carried out under the planning permission granted under Reg. Ref.: F17A/0615. It was formerly part of the grounds of Santa Sabina Dominican College. The school buildings are to the East of the proposed development, with open space to the South. There is a housing scheme, Glencarrig, to the North and a Church associated buildings to the West.

BRE guideline recommends that: “Loss of light to existing windows need not be assessed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window.”

“To check for this if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse light of the existing building may be adversely affected.”

If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.

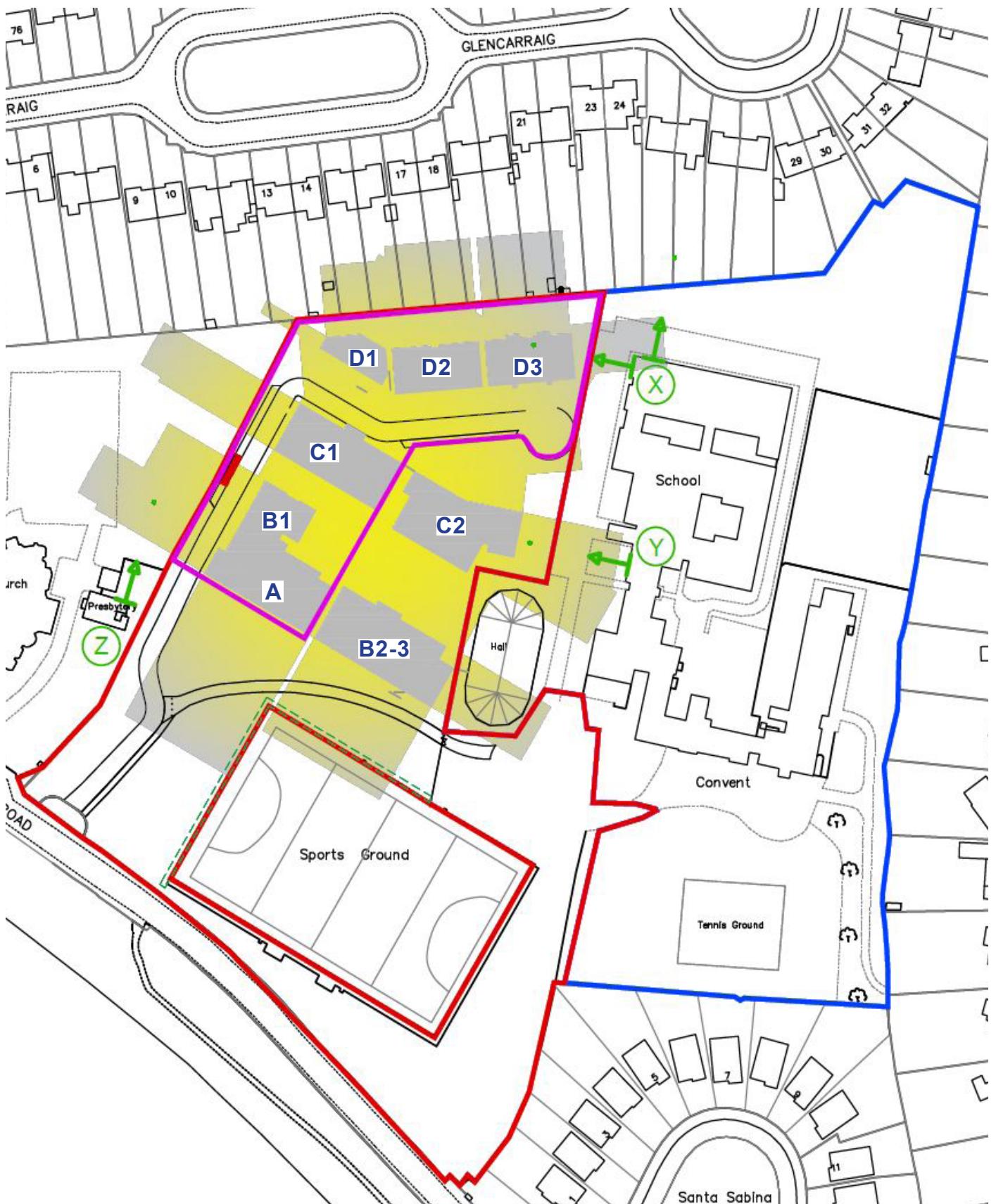


Figure 2. Plan of the site with zones three times the height of the proposed buildings indicated, an initial assessment for effect on daylight to adjacent properties.

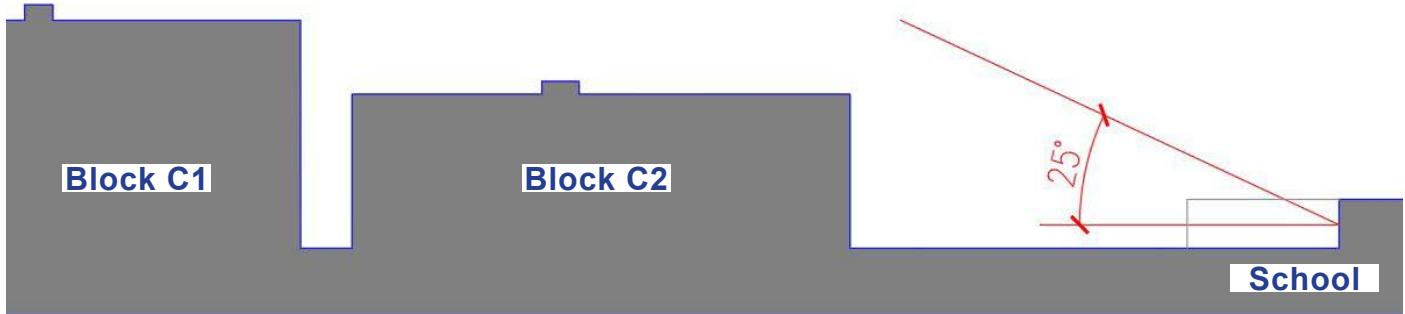


Figure 3. Section through window wall of the school at location point Y.

Figure 2 indicates in plan the zone of influence 3 times the height of the proposed buildings.

- This does not extend to the houses to the North in Glencarrig, so no further assessment is required there.
- While outside of the zone of influence, the Presbytery to the West is within 45° and so was considered. It does not have windows facing the development and so would not be impacted, (see location 'Z').
- The zone marginally reaches to the school to the East, it was assessed further.

In the school, the corner room at location 'X' is dual aspect, with windows facing away from the development, any impact would be imperceptible. Figure 3 shows a section through the window wall of the school, at location 'Y'. The proposed development does not subtend the 25 degree angle, no further assessment is required.

Conclusion

The preliminary assessment indicates there will be no impact to daylight for the surrounding buildings and the proposed development meets the recommendations of the BRE Guidelines and BS8208 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.

4. Assessment of quality of Daylight within the Proposed Development

Assessment for Average Daylight Factor.

The BRE guidelines recommend that the Average Daylight Factor be quantified in new developments, with only living rooms and bedrooms requiring assessment. Due to the design of the scheme, with simple shaped blocks and many dual aspect units, one unit type, and some single bedrooms were identified as having the potentially lowest internal daylight. These were assessed as the worst-case scenarios. The results are set out in Table 2 below. Location plans and generated analysis are shown below in Figures 4 - 7 below.

| Average Daylight Factor (ADF) | | | | | |
|-------------------------------|--------------|---------|----------------------|------|---|
| Location | | Use | Daylight Factor | | |
| Proposed | Minimum ADF | | | | |
| Block A | Ground Floor | A GF 01 | Livingroom & Kitchen | 4.44 | 2 |
| | | | Bedroom No.1 | 3.23 | 1 |
| | | | Bedroom No.2 | 3.94 | 1 |
| Block D | Ground Floor | D GF 02 | Bedroom No.3 | 2.29 | 1 |
| | | D GF 03 | Bedroom No.3 | 2.34 | 1 |
| | | D GF 04 | Bedroom No.3 | 2.32 | 1 |

Table 2: Average Daylight Factor for the identified worst case rooms.

BS 8206-2 gives minimum values of ADF of 2% for kitchens and living rooms which include a kitchen, 1.5% for living rooms and 1% for bedrooms. An average daylight factor of 5% is a well daylit space.

Within the development the design was optimised with regard to the BRE guidelines. Habitable rooms in the most challenged position, were assessed; these exceed the minimum ADF by two times. All rooms should receive good daylight.

Conclusion

All habitable rooms in the unit assessed exceed the minimum levels set out and therefore meet the recommendations of the BRE Guidelines and BS8208 Part 2:2008 Lighting for Buildings, Code of Practice for Daylighting.



Figure 4. Ground floor plan of Block A/ B1, showing unit assessed for Average Daylight Factor

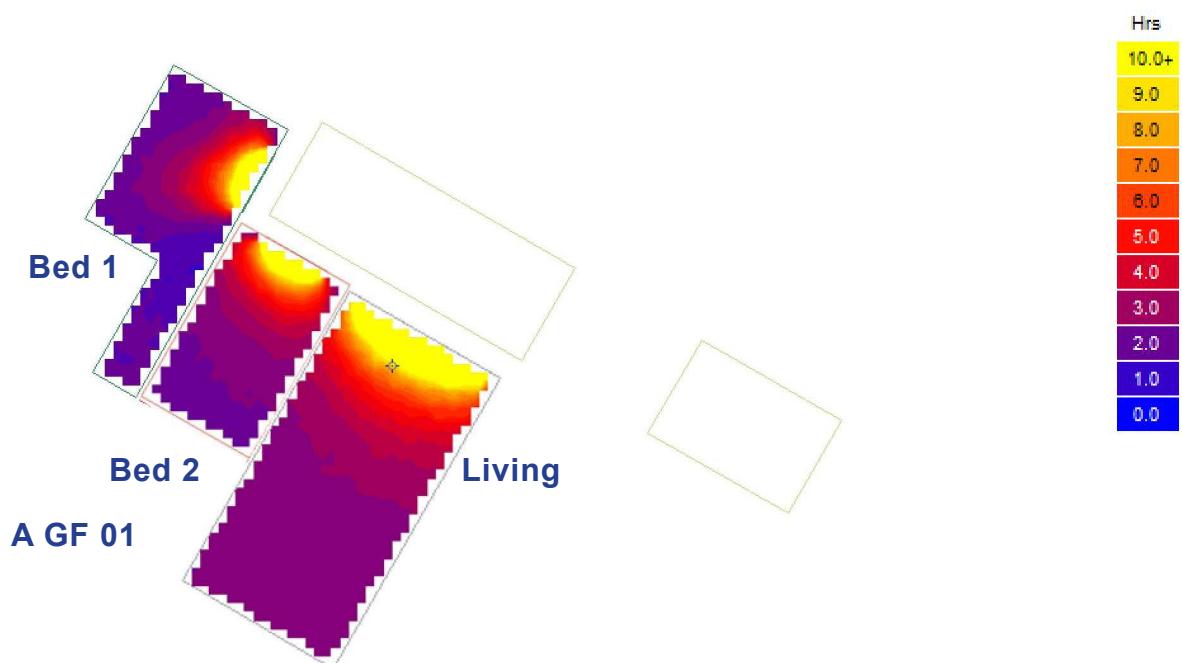


Figure 5. Generated analysis for ADF of the rooms within the selected ground floor unit in Block A. The scale represents the percentage of daylight received from 0 - 10 hours.

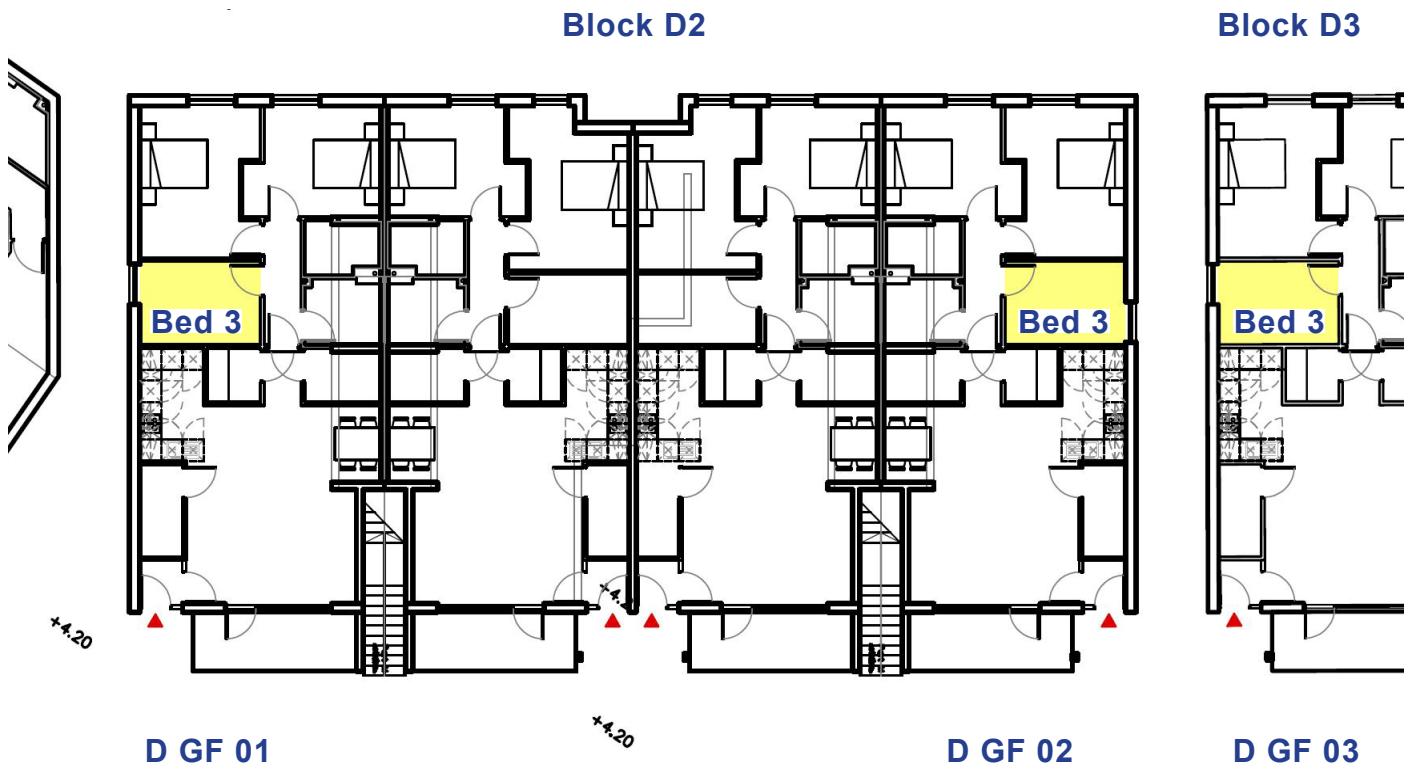


Figure 6. Ground floor plan of Blocks D2 & D3, showing unit assessed for Average Daylight Factor

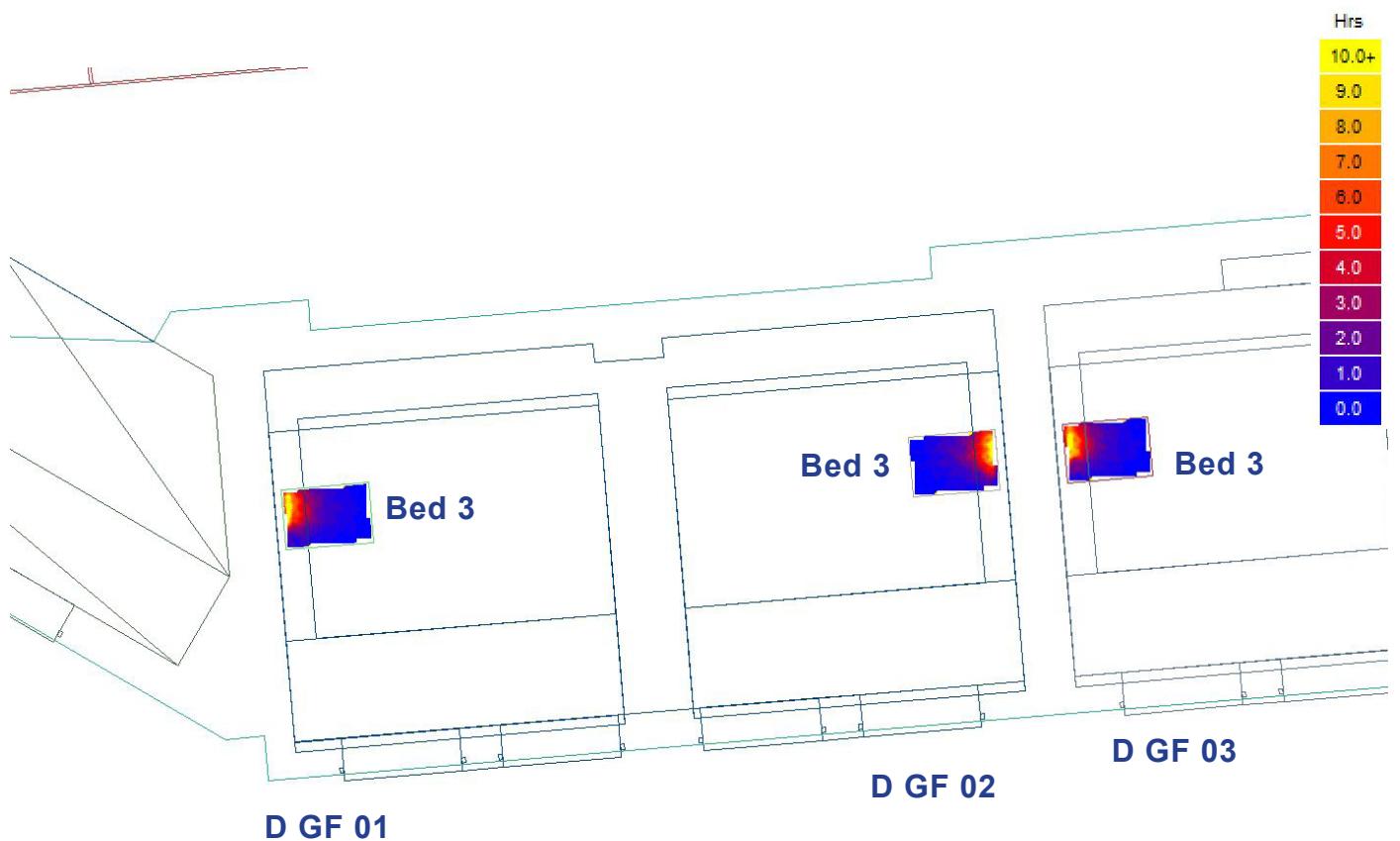


Figure 7. Generated analysis for ADF within the selected ground floor rooms in Block D. The scale represents the percentage of daylight received from 0 - 10 hours.

5. Sunlight to gardens and open spaces



Figure 8. Site plan indicating public open space / amenity areas.

The proposed development is well laid out with the majority of the amenity space to the South. There is a courtyard spaces between the two proposed apartment blocks. There is an extensive amenity area proposed to the south of the proposed apartments. The majority of the public open space will receive in excess of 2 hours sunlight during the course of the day on the 21st March as it is to the south of the development and a detailed assessment is not required. This can be seen in a visual inspection of the shadow diagrams in Appendix A.

The BRE guidelines recommend using the 21st March for plotting shadow diagrams. June 21st and December 21st are shown for information. It should be noted that the summer solstice is the best case scenario with shadows at their shortest, and even low buildings will cast long shadows in the winter; it is common for large areas of the ground to be in shadow.

A visual inspection of the shadow diagrams for the 21 March indicates that there will be no additional shading to the rear gardens at the houses to the North of the proposed development and so no further assessment is required. There is some minor shadow cast from the proposed development to the school to the West late in the evening. This is to circulation space and will not have any adverse impact on sunlight to the school's amenity.

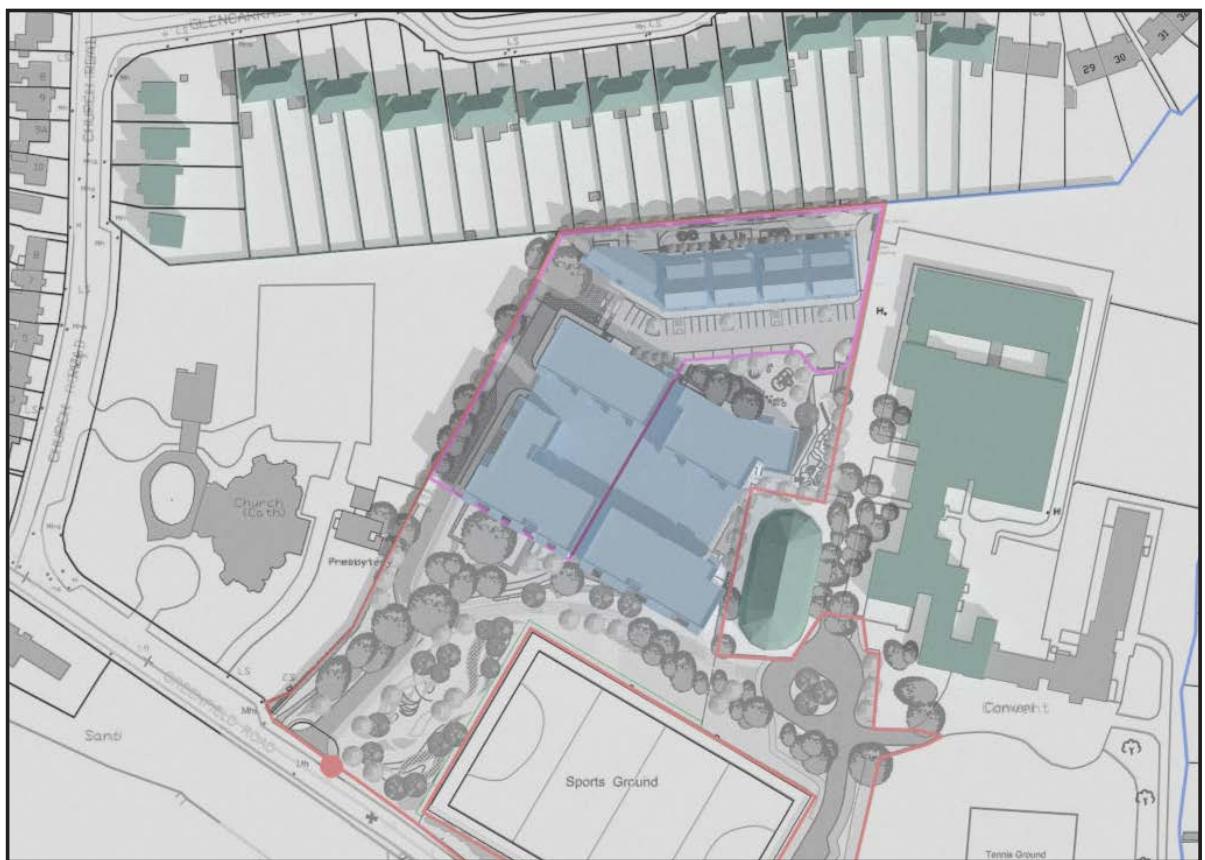
Shadow diagrams (fig 9 - 12) for the Equinox 21 March at two hourly intervals during the day. These compare the previously approved scheme with this proposal.

Conclusion

There will be no reduction in the available sunlight on the ground to any adjacent residences. The amenity space to the proposed development meets the recommendations of the BRE guidelines and will receive in excess of 2 hours sunlight over 50% of the open space.

Appendix A

Shadow Casting diagrams March Equinox



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 9. Shadow diagrams 21 March 10:00 GMT

Appendix A

Shadow Casting diagrams March Equinox



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

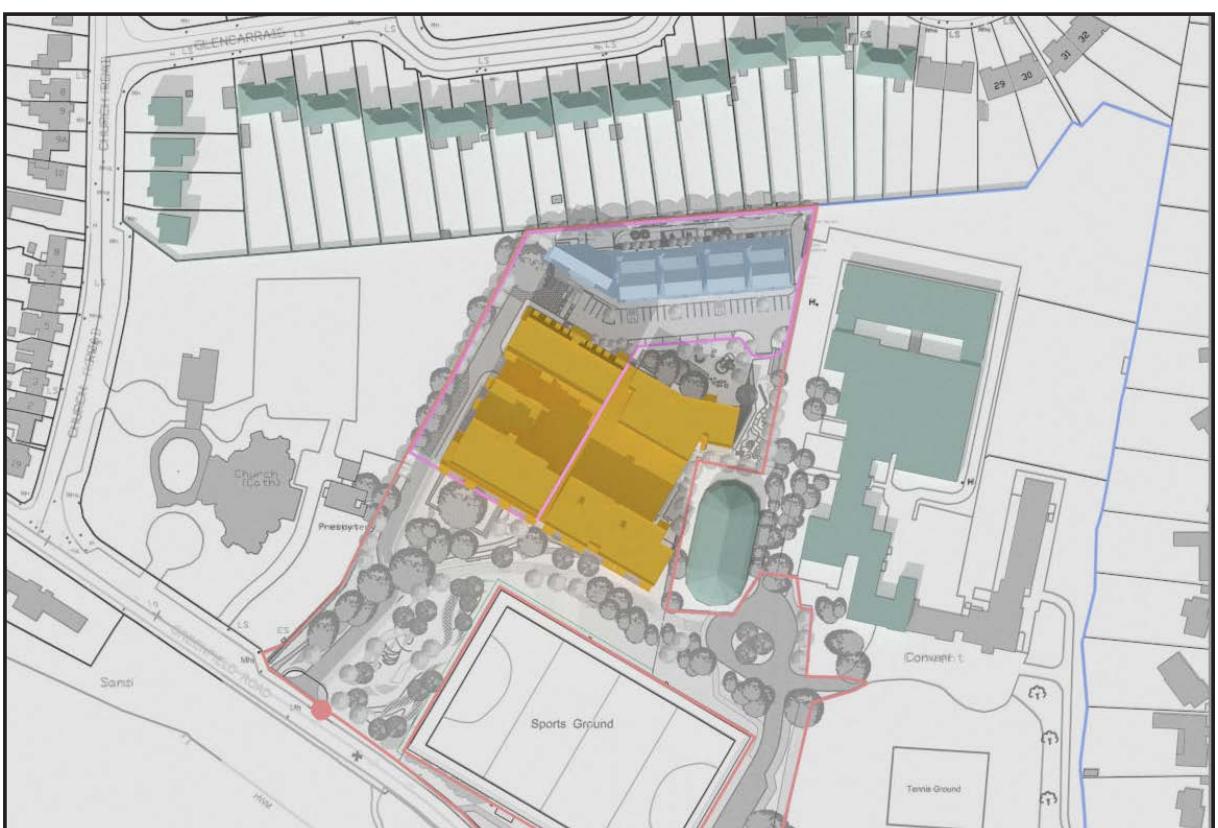
Figure 10. Shadow diagrams 21 March 12:00 GMT

Appendix A

Shadow Casting diagrams March Equinox



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168

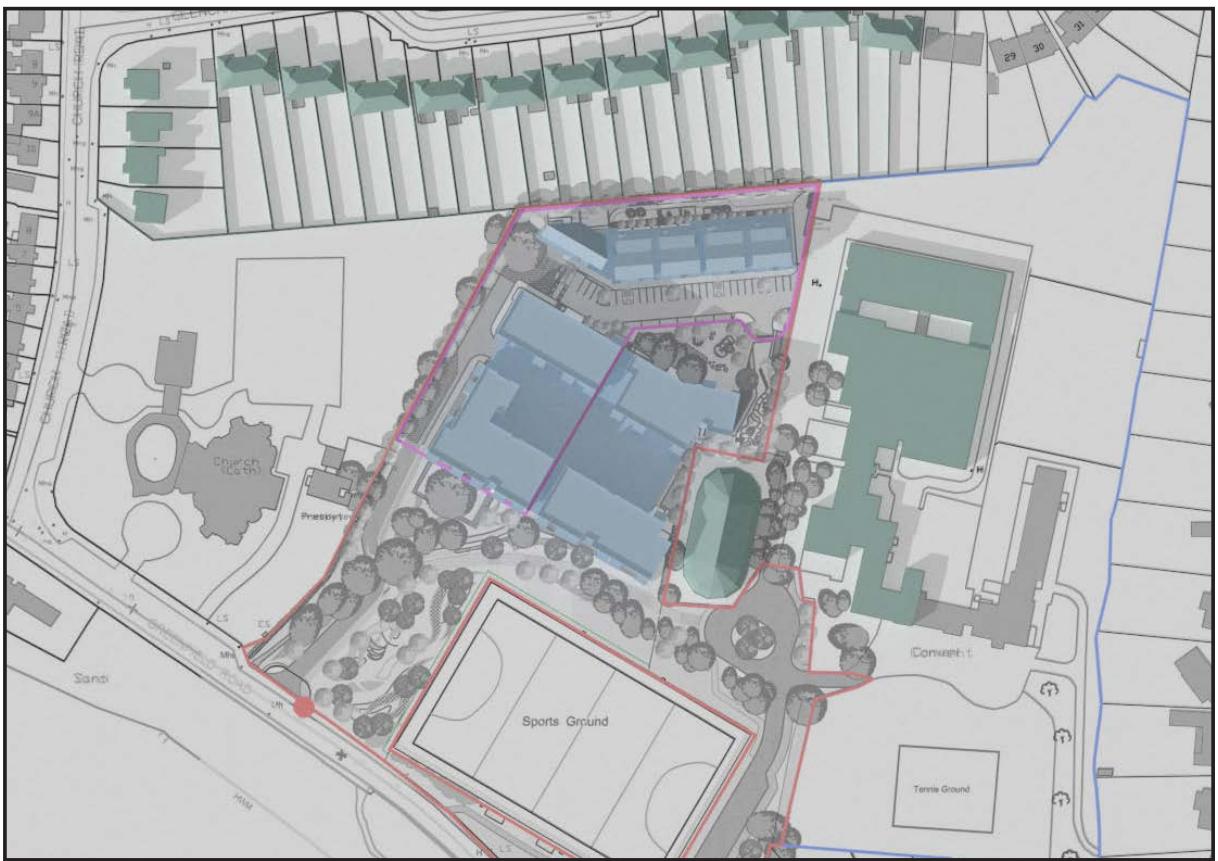


Proposed

Figure 11. Shadow diagrams 21 March 14:00 GMT

Appendix A

Shadow Casting diagrams March Equinox



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 12. Shadow diagrams 21 March 16:00 GMT

Appendix A

Shadow Casting diagrams June Solstice



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 13. Shadow diagrams 21 June 10:00 GMT

Shadow Casting diagrams June Solstice
Appendix A



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 14. Shadow diagrams 21 June 12:00 GMT

Appendix A

Shadow Casting diagrams June Solstice



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 15. Shadow diagrams 21 June 14:00 GMT

Shadow Casting diagrams June Solstice



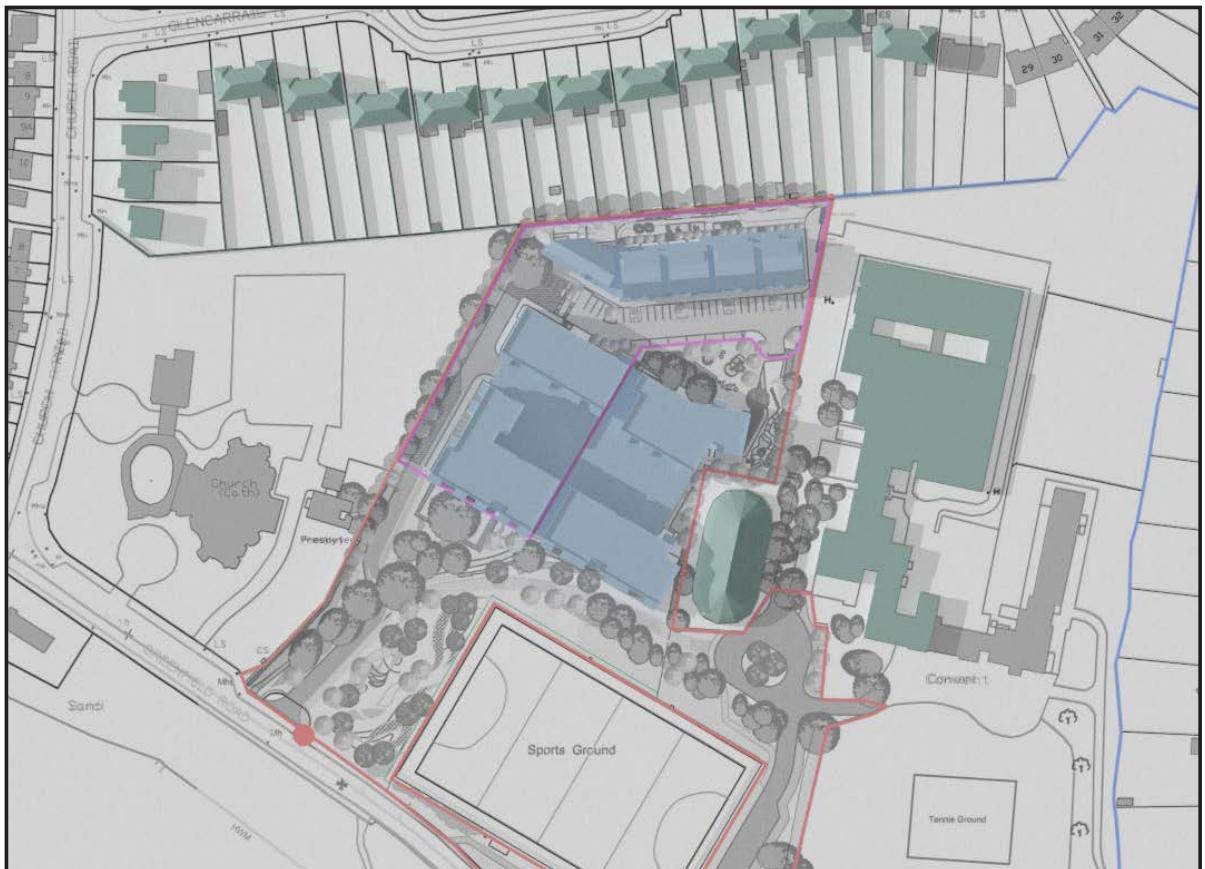
Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 16. Shadow diagrams 21 June 16:00 GMT

Shadow Casting diagrams June Solstice



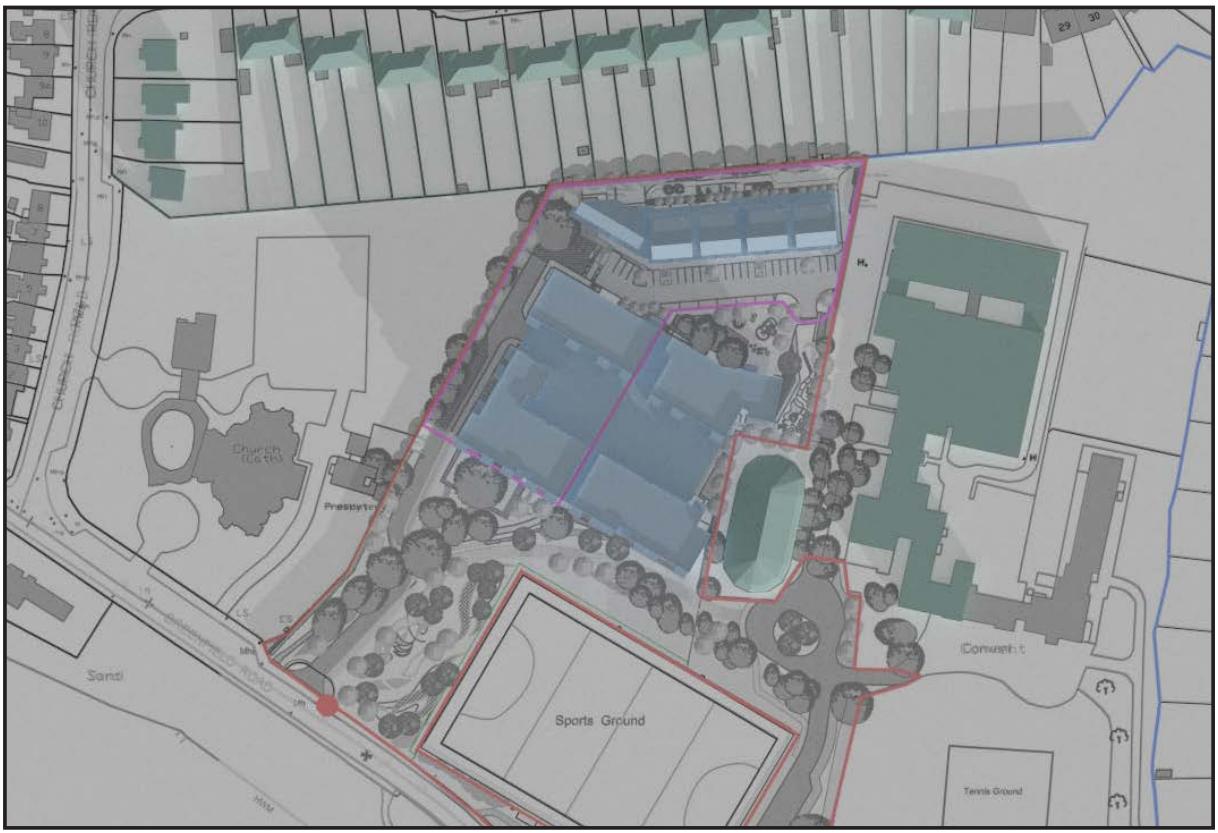
Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 17. Shadow diagrams 21 June 18:00 GMT

Shadow Casting diagrams December Solstice



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168

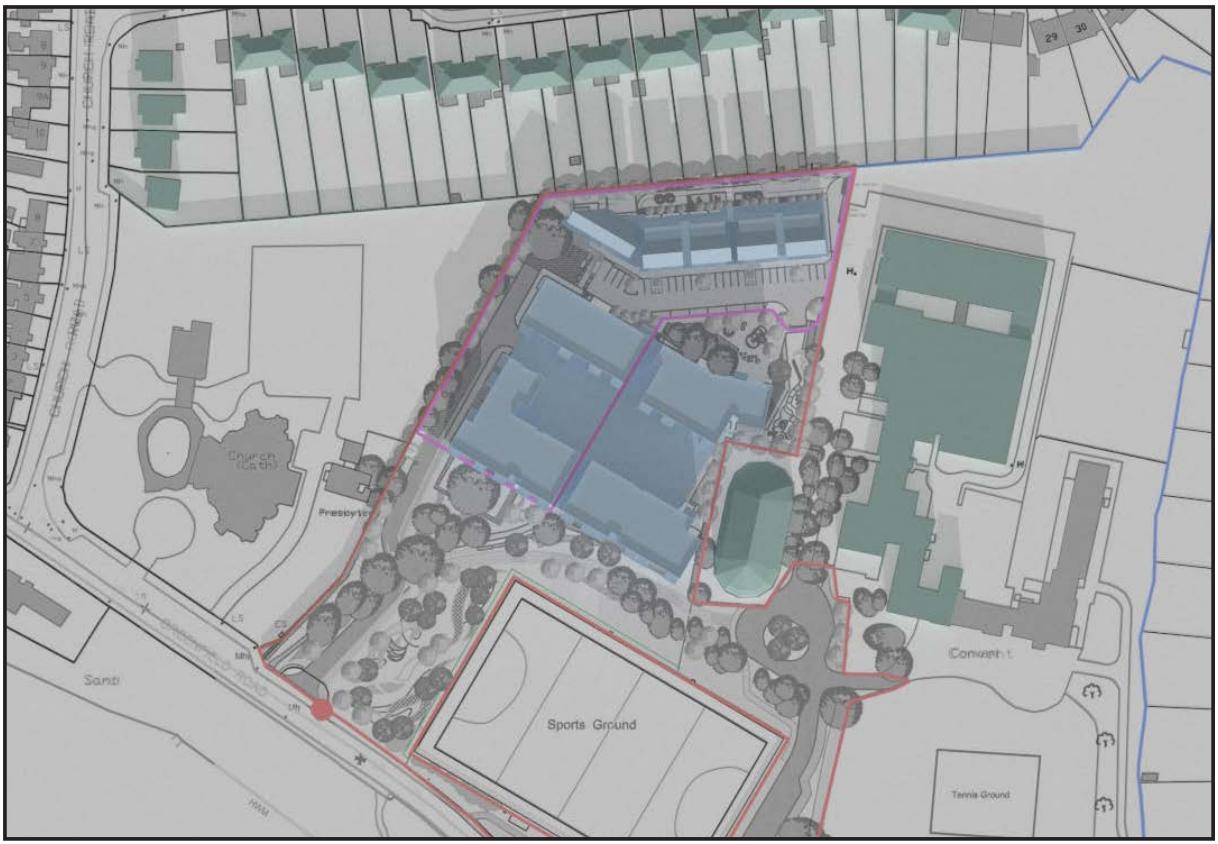
N
N



Proposed

Figure 18. Shadow diagrams 21 December 10:00 GMT

Shadow Casting diagrams December Solstice



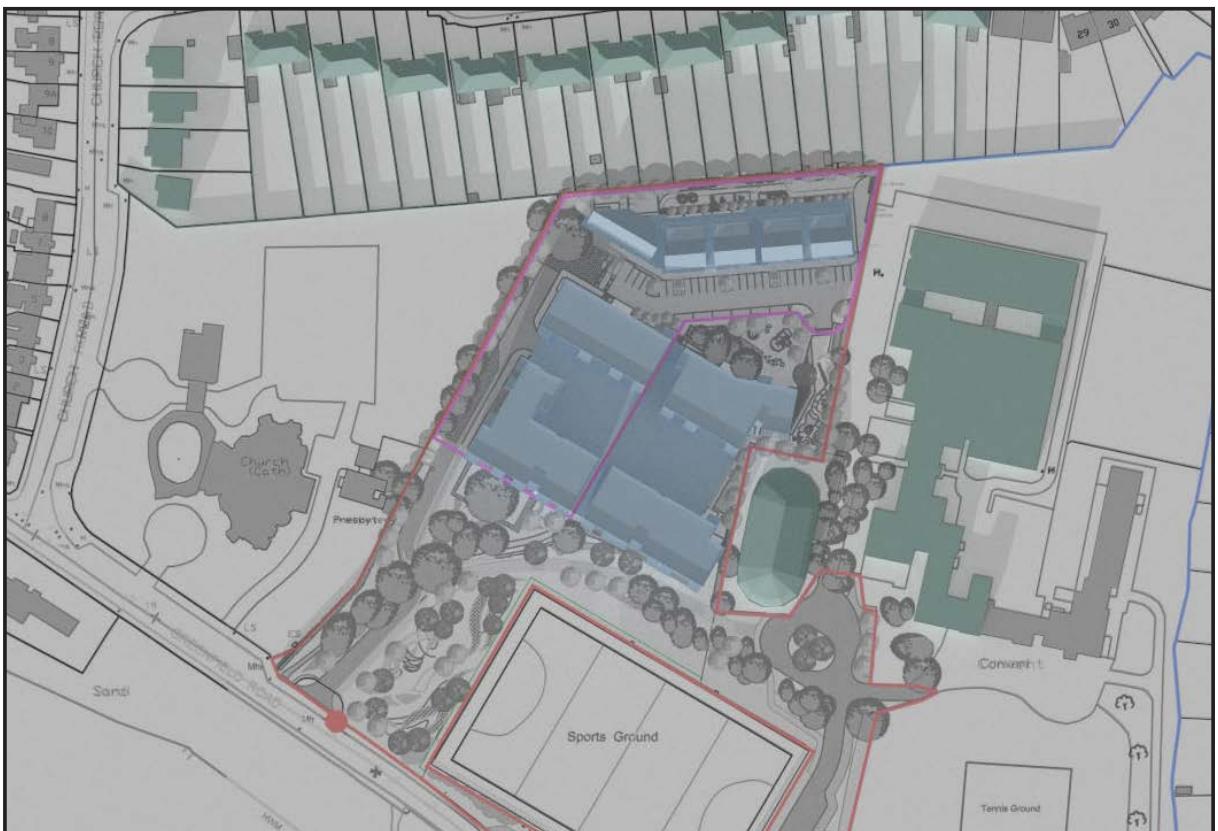
Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 19. Shadow diagrams 21 December 12:00 GMT

Shadow Casting diagrams December Solstice



Planning approved under Reg. Ref.: F17A/0615, F15a/0303 and ABP Ref.: PL06F. 235619 / F09A/0168



Proposed

Figure 20. Shadow diagrams 21 December 14:00 GMT