Shalom Nursing Home, Dreghorn, Irvine
Scotland

Daylight & Sunlight Report

November 2023

WATERSLADE

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1 Introduction and Methodology

Generally

1.1 We have been instructed to examine the impact that the proposed new build scheme on the site of Shalom Nursing Home at 163 Main Street, Dreghorn will have in relation to daylight and sunlight amenity enjoyed by the neighbouring residential property at 22 Muirhall Place.

1.2 It is usual to assess daylight and sunlight in relation to the guidelines set out in the 2022 Building Research Establishment report 'Site layout planning for daylight and sunlight - A guide to good practice' by Paul Littlefair. This document is most widely accepted by planning authorities as the means by which to judge the acceptability of a scheme.

1.3 The BRE guidelines are not mandatory, and they explicitly state that the numerical target values should be interpreted flexibly. While local planning authorities will consider the acceptability of a proposed scheme in relation to BRE guidance, consideration will be given to the context within which a scheme is located, and daylight and sunlight will be one of a number of planning considerations.

1.4 The BRE guidelines provide two principal measures of daylight for assessing the impact on properties neighbouring a site, namely Vertical Sky Component (VSC) and No-Sky Line (NSL). In terms of sunlight we examine the BRE Annual Probable Sunlight Hours (APSH); and in relation to sunlight amenity to gardens and amenity spaces, we apply the quantitative BRE overshadowing guidance. These measures of daylight and sunlight are discussed in the following paragraphs –

Diffuse Daylight

1.5 **Vertical Sky Component (VSC)** – VSC is a measure of the direct skylight reaching a point from an overcast sky. It is the ratio of the illuminance at a point on a given vertical plane to the illuminance at a point on a horizontal plane due to an unobstructed sky.

1.6 For existing buildings, the BRE guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall.

1.7 The BRE guidelines state that if the VSC at the centre of a window is less than 27%, and it is less than 0.8 times its former value (i.e. the proportional reduction is greater than 20%), then the reduction in skylight will be noticeable, and the existing building may be adversely affected.

1.8 **No-Sky Line (NSL) -** NSL is a measure of the distribution of daylight within a room. It maps out the region within a room where light can penetrate directly from the sky, and therefore accounts for the size of and number of windows by simple geometry.

1.9 The BRE suggest that the area of the working plane within a room that can receive direct skylight should not be reduced to less than 0.8 times its former value (i.e. the proportional reduction in area should not be greater than 20%).

Sunlight

1.10 **Annual Probable Sunlight Hours (APSH) -** In relation to sunlight, the BRE recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available, including at least 5% in winter.

1.11 Where the proposed values fall short of these, and the absolute loss is greater than 4%, then the proposed values should not be less than 0.8 times their previous value in each period (i.e. the proportional reductions should not be greater than 20%).

1.12 The BRE guidelines state that *'...all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block out too much sun'*.

1.13 The APSH figures are calculated for each window, and where a room is served by more than one window the contribution of each is accounted for in the overall figures for the room. The acceptability criteria are applied to overall room based figures.

Overshadowing

1.14 Section 3.3 of the BRE guidelines describes the method of assessment of the availability of sunlight within garden/amenity spaces. This relates to the proportion of shading on March 21st.

1.15 The BRE criteria for gardens or amenity areas are as follows, *'It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity space should receive at least two hours of sunlight on 21 March. If as a result of a new development an existing garden or amenity space does not meet the above, and the area that 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.'*

2 Sources of Information

Linnen Civil Engineering and Surveying Limited
- Information (received 10/10/2023)
  - SNH_C_1_001 3D MODEL.dwg
  - SNH_C_1_005 SOUTH NORTH ELEVATION.dwg
  - SNH_C_1_006 WEST EAST ELEVATION.dwg

Promap
- Information (received 24/10/23)
  - Promap-2596856-2701872-720-0.dwg

NVDC Architects

Proposed Scheme (received 19/10/23)
- NV0616_E(0)125 - Existing Elevations.pdf
- Pre(2)099 BF Plan as Proposed.pdf
- Pre(2)125 Elevations as Proposed.pdf

Proposed Information (received 31/10/23)
- Pre(3)130 Section Opts.pdf

3 Drawings Attached

Drawing Number:	Title:
W1349_01-03	Site Plan and 3D Views as Existing
W1349_07-09	Site Plan and 3D Views as Proposed
W1349_SHA_04&05	2hr Overshadowing Assessment

4 Calculations and Assumptions

4.1 In order to calculate the various measures of daylight and sunlight it is necessary to construct a 3D computer model. The model is then analysed using proprietary software to calculate the various measures of daylight and sunlight.

4.2 The massing and window apertures of the neighbouring properties were guided by 2D survey and site photography. The existing buildings and proposed scheme were based on the 2D drawings provided by the Architects.

4.3 The 3D model is created to reproduce the massing of the buildings both on and surrounding the site at a level of detail appropriate to the calculations performed. All heights in the model are in mm Above Ordnance Datum (AOD).

4.4 In assessing the impact of new development on neighbouring properties, it is usual to only consider main habitable spaces (i.e. living rooms, bedrooms and kitchens) within residential properties. In accordance with the BRE and British Standard guidance, VSC and APSH values have been calculated at the window centre, on the outside wall face. For windows with a cill below the working plane level, the window area above and below the working plane has been considered separately and weighted in accordance with the latest BRE guidance.

4.5 Best estimates were made in establishing building use (residential or commercial) and room uses; generally, these were made from external observation, VOA searches and recourse to planning records where available. Where floor plan information could not be obtained, reasonable assumptions have been made as to the internal configuration of the rooms behind the fenestration. Unless the building form suggests otherwise, rooms have generally been assumed to be 4.2 m deep or half the depth of the building.

5 Results and Discussion

5.1 Initially, a 3-dimensional computer model of the existing site, proposed development, and all the surrounding buildings were created. The model was analysed using proprietary software to calculate the various measures of daylight and sunlight. Existing light levels were then compared with the corresponding levels with the proposed development in place. The resulting levels and their reductions were then compared to the relevant BRE report guidelines.

5.2 We refer to attached drawings W1349/01-03 which illustrate the site in plan and 3D prior to development. Drawings W1349/07-09 illustrate the proposed development. Drawings W1349/02-03 and W1349/08-09 show the window locations within the neighbouring residential properties that have been considered in detail. For the purpose of this analysis, each window and room are given a unique reference. This is necessary to track the windows through various calculations. These labels appear in the table of results which summarises the daylight and sunlight results for all main windows serving habitable rooms.

22 Muirhall Place

5.3 This two-storey property is located to the north-west of the site. The ground floor living room which has the closest windows to the proposed development is dual aspect and it`s served by a small flank window which faces the proposed development, and a principal rear facing window which does not directly face the development.

5.4 Whilst there will be a noticeable VSC impact to the secondary flank wall window the impact to the principal rear-facing window will be negligible. Furthermore, the change in the daylight level in the room as measured by NSL is negligible.

5.5 Given that the ground floor room is not materially impacted, it is clear that the first-floor room will not be impacted.

5.6 In relation to sunlight, the principal window has a northerly aspect and therefore there is little expectation of sunlight, however, since the secondary flank wall window does have a southerly aspect, the sunlight levels to the room have been calculated. Whilst there will be a reduction in sunlight to the flank wall window, the retained APSH to the room will be 30%, which is above the BRE suggested target of 25%. Similarly, the retained winter APSH will be above the BRE minimum of 5%. Therefore, the retained sunlight levels will be very good.

Overshadowing

5.7 Drawings W1349_SHA_04-05 show the area of the rear garden that receives 2 hours of sunlight on the 21st of March, 21st of June and 3rd of April. Since the rear garden has a north-easterly aspect and therefore, its access to sunlight is partially obstructed by the property and its boundary wall.

5.8 The BRE guidelines suggest that a garden should receive 2 hours of sunlight over 50% of its area on the 21st of March and, in this case, the percentage of the garden that receives 2 hours of sunlight is 33%, which is below the target. However, drawing W1349_SHA_05 show that the target is achieved two weeks later on the 3rd of April. This is not very different to achieving the target on the 21st of March, and given its orientation is a reasonable result for the time of year.

5.9 Furthermore, in mid-summer when the garden is more likely to be used the access to sunlight will be good.

6 Summary and Conclusions

6.1 We have undertaken a detailed assessment of the impact of the proposed development in relation to the BRE guidelines on daylight and sunlight.

6.2 Whistle there will be a noticeable impact to the secondary ground floor flank window, the impact to the principal rear patio door will be minimal and the loss of daylight to the room will be small.

6.3 The impact to the room as measured by NSL is minimal and fully compliant with the BRE guidelines.

6.4 The sunlight impact on the room will comply with the BRE guidelines.

6.5 Whilst there will be some overshadowing impact to the rear garden this is to be expected given its north-easterly orientation and instead of achieving the 50% BRE target on the 21st of March, it is achieved 2 weeks later on the 3rd of April. This is not a significant departure from the guidelines and access to the sunlight in the summer, when the garden is more likely to be used, will be good.

6.6 Overall, the impact of the proposed scheme will be small, and the neighbouring property will retain good daylight and sunlight amenity and therefore the impact of the development should be regarded as acceptable.

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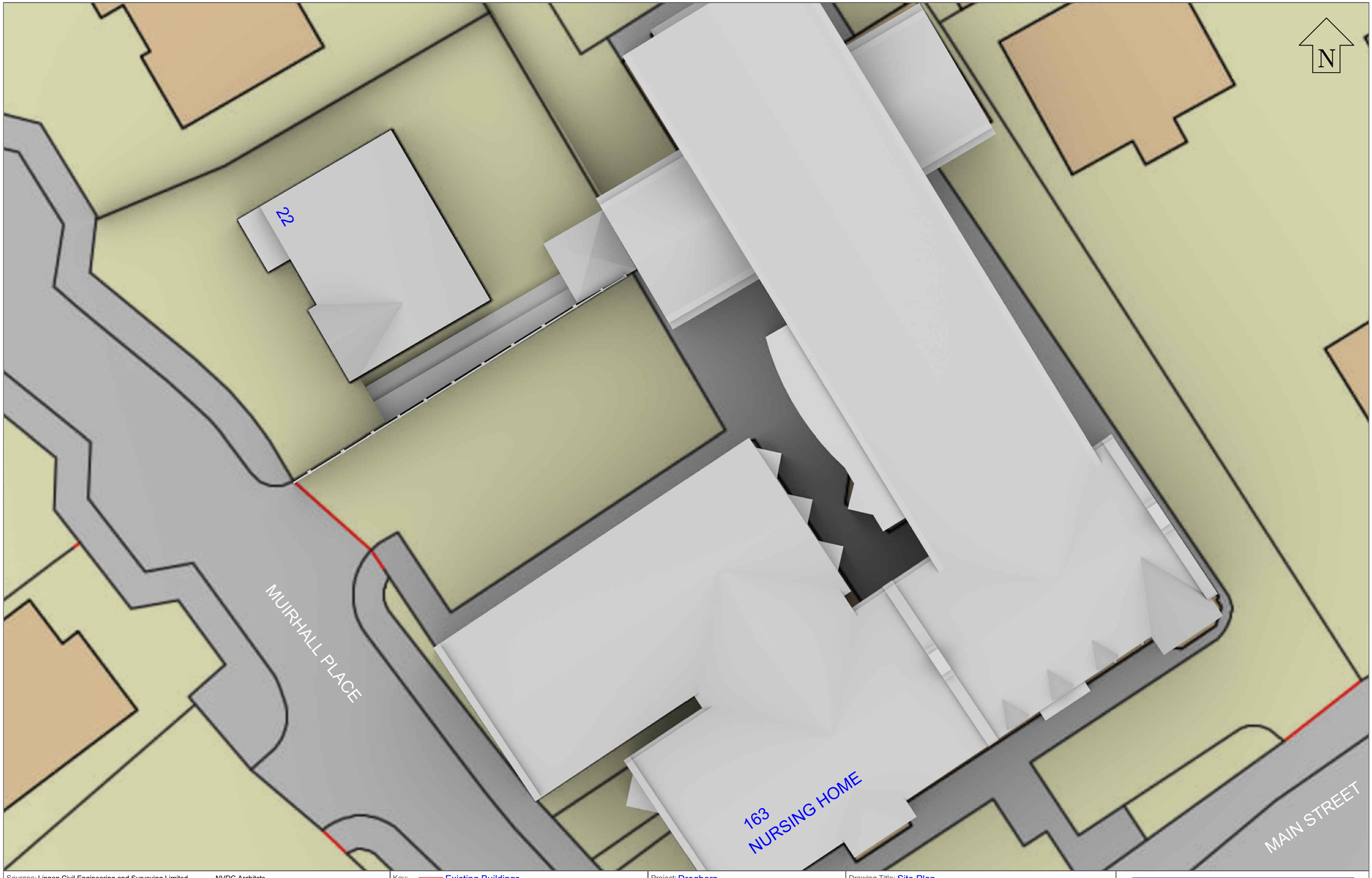

Sources: Linnen Civil Engineering and Surveying Limited
Survey Info (received 10/10/23)
SNH_C_1_001 3D MODEL.dwg
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NVDC Architcts
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Pre(2)099 BF Plan as Proposed.pdf
Pre(2)125 Elevations as Proposed.pdf

Key: Existing Buildings
Proposed Scheme

Project: Dreghorn
Scotland

Drawing Title: Site Plan
Existing Buildings

Drawn By: TP

Date: Oct 23

Scale: 1:200 @ A3

Drawing No: W1349_01

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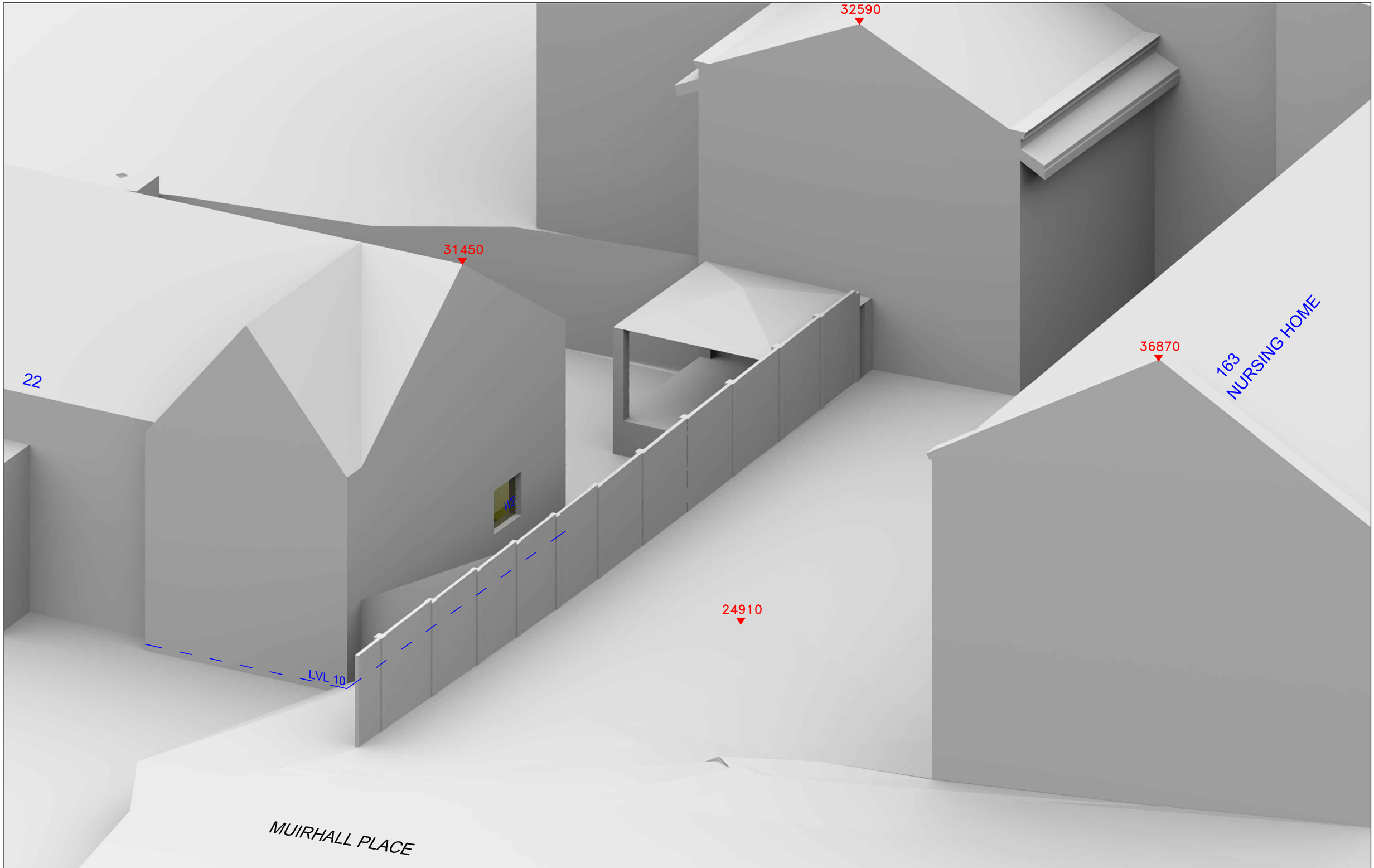

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Key: Existing Buildings
Proposed Scheme
All Heights in mm AOD

Project: Dreghorn
Scotland

Drawn By: TP

Date: Oct 23

Drawing Title: 3D View
Existing Buildings

Scale: NTS

Drawing No: W1349_02

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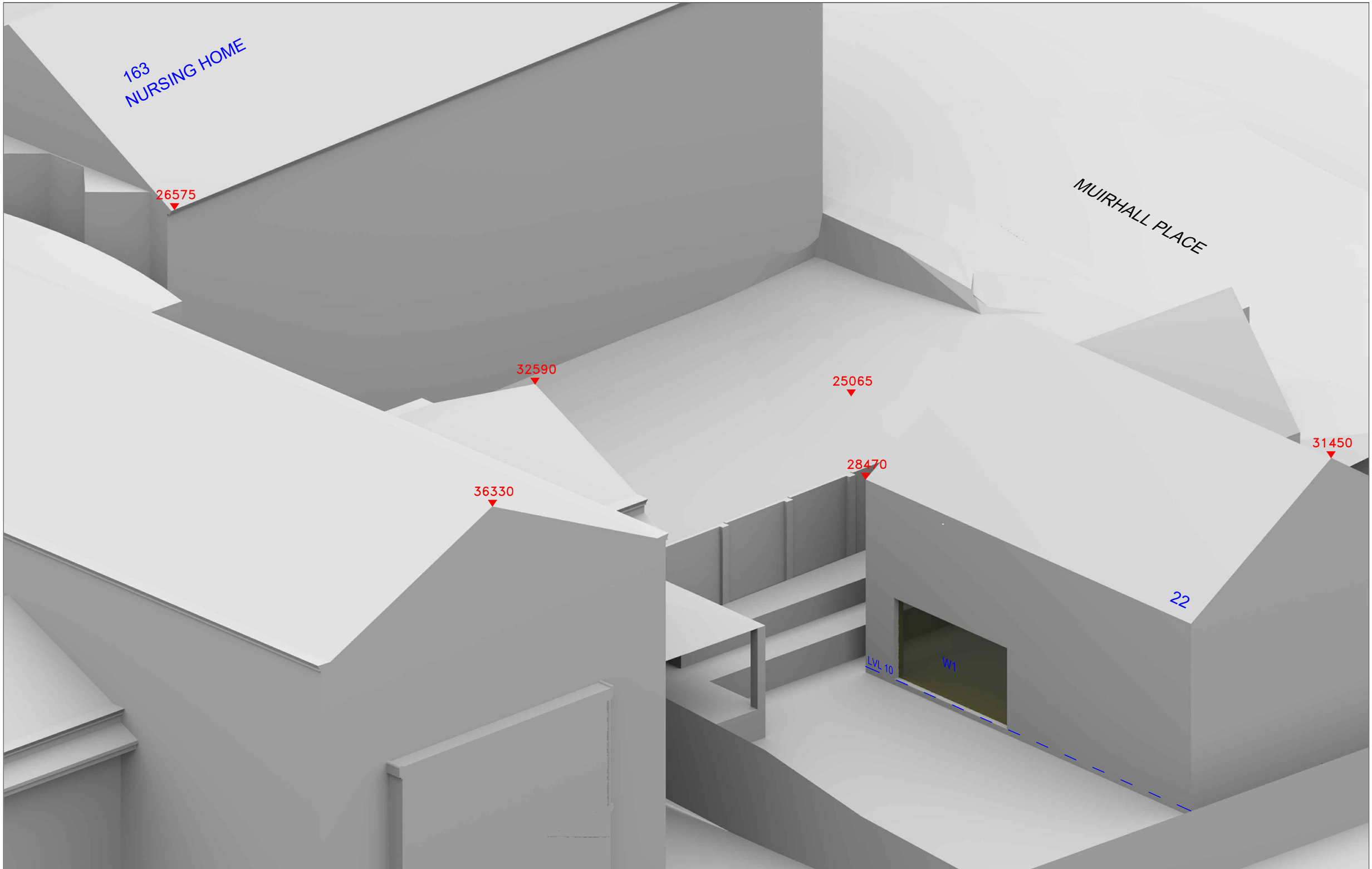

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Proposed Scheme
All Heights in mm AOD

Project: Dreghorn
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Drawing Title: 3D View
Existing Buildings

Drawn By: TP

Date: Oct 23

Scale: NTS

Drawing No: W1349_03

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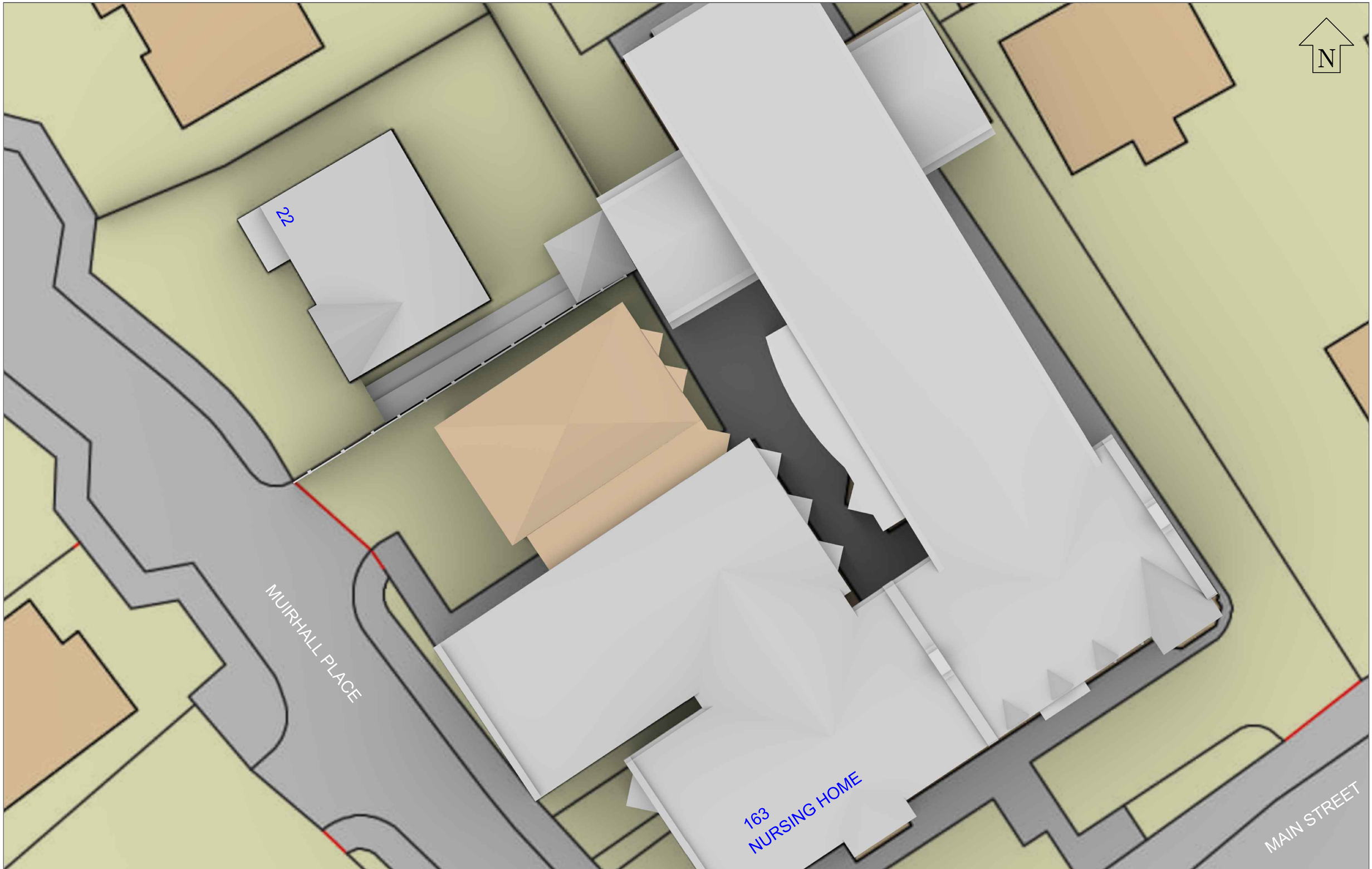

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Pre(3)130 Section Opts.pdf

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Proposed Scheme

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Drawing Title: Site Plan
Proposed Scheme received 31/10/23

Drawn By: TP

Date: Nov 23

Scale: 1:200 @ A3

Drawing No: W1349_07

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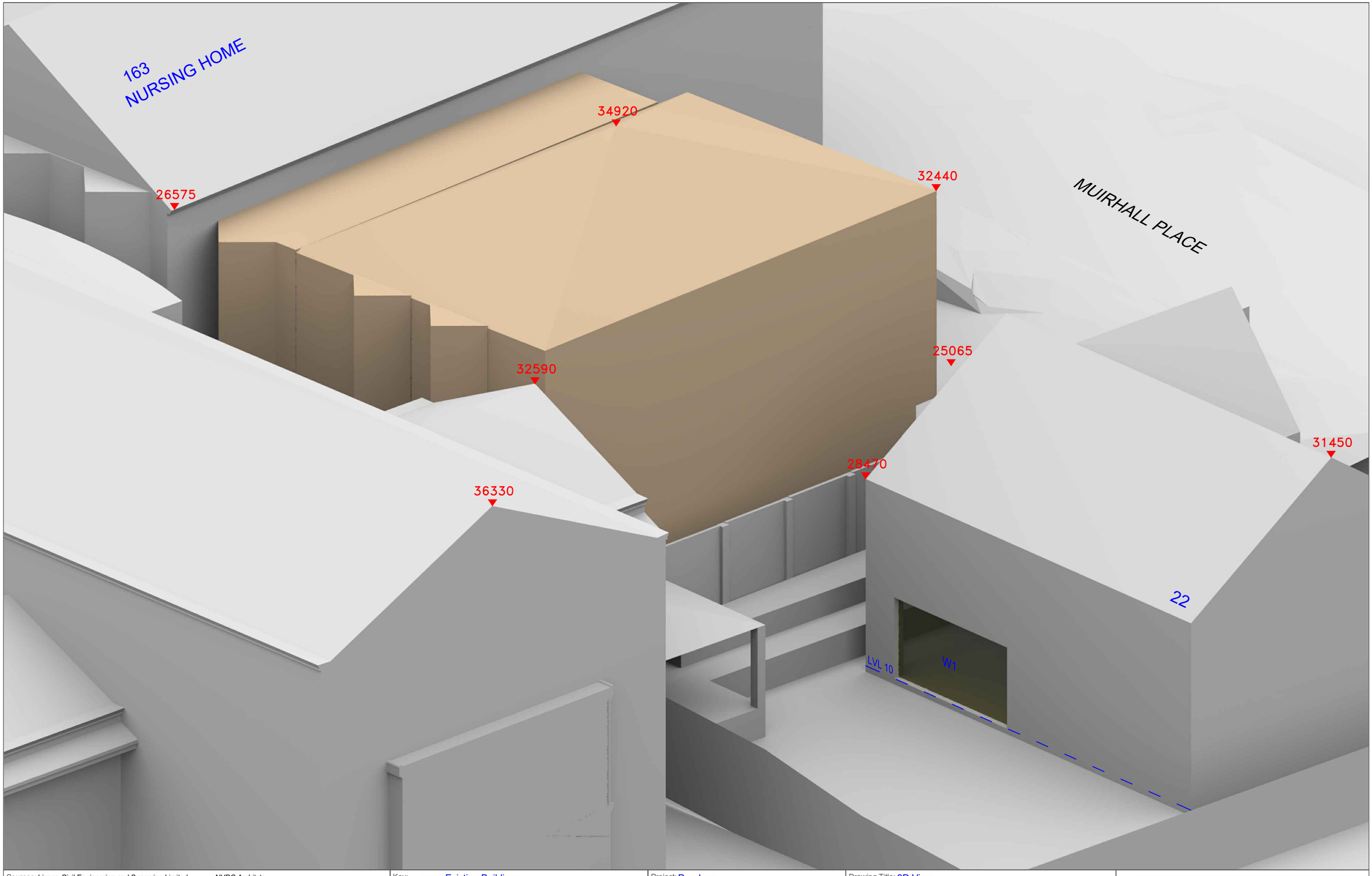

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Key: Existing Buildings
Proposed Scheme
All Heights in mm AOD

Project: Dreghorn
Scotland

Drawing Title: 3D View
Proposed Scheme received 31/10/23

Drawn By: TP

Date: Nov 23

Scale: NTS

Drawing No: W1349_09

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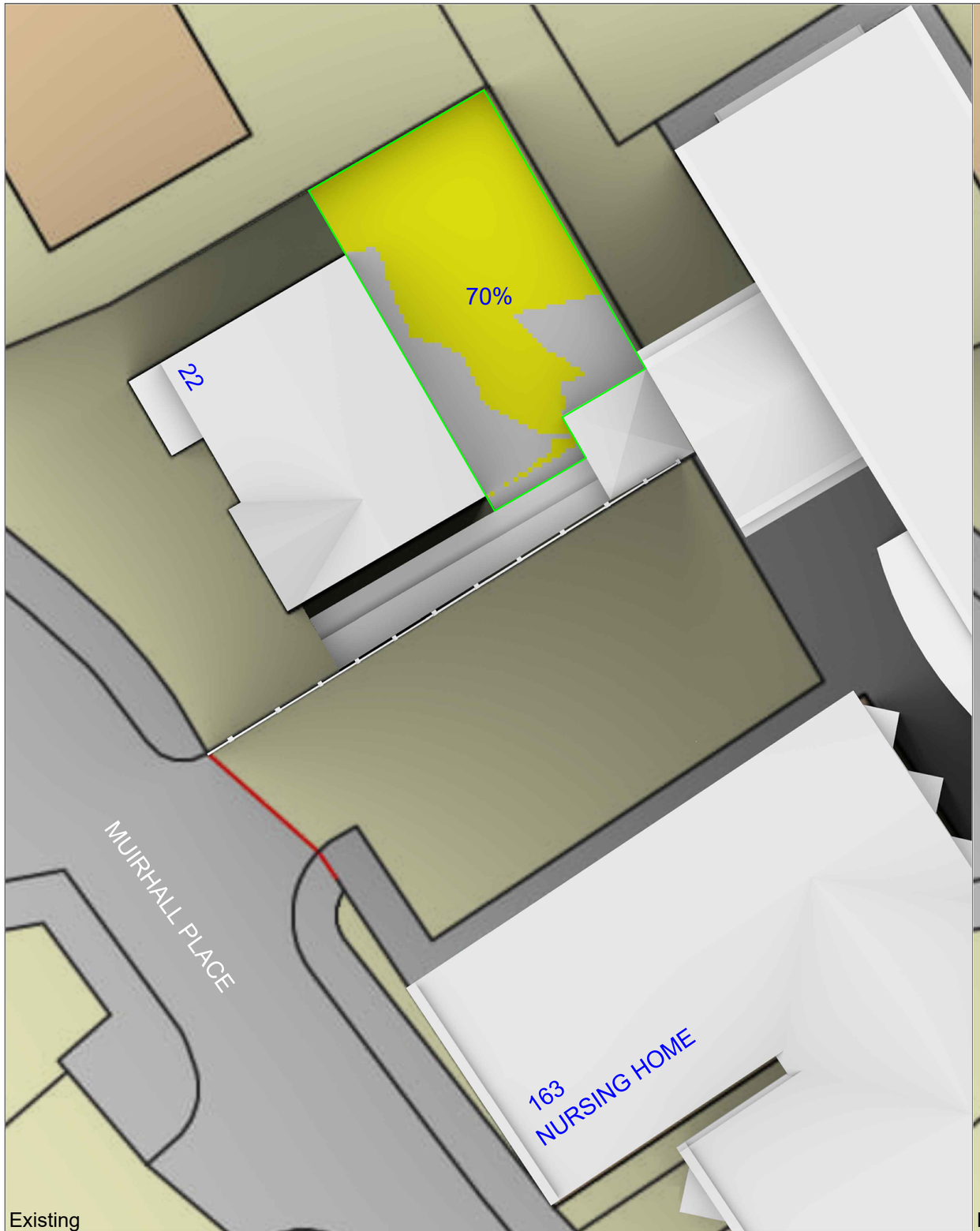

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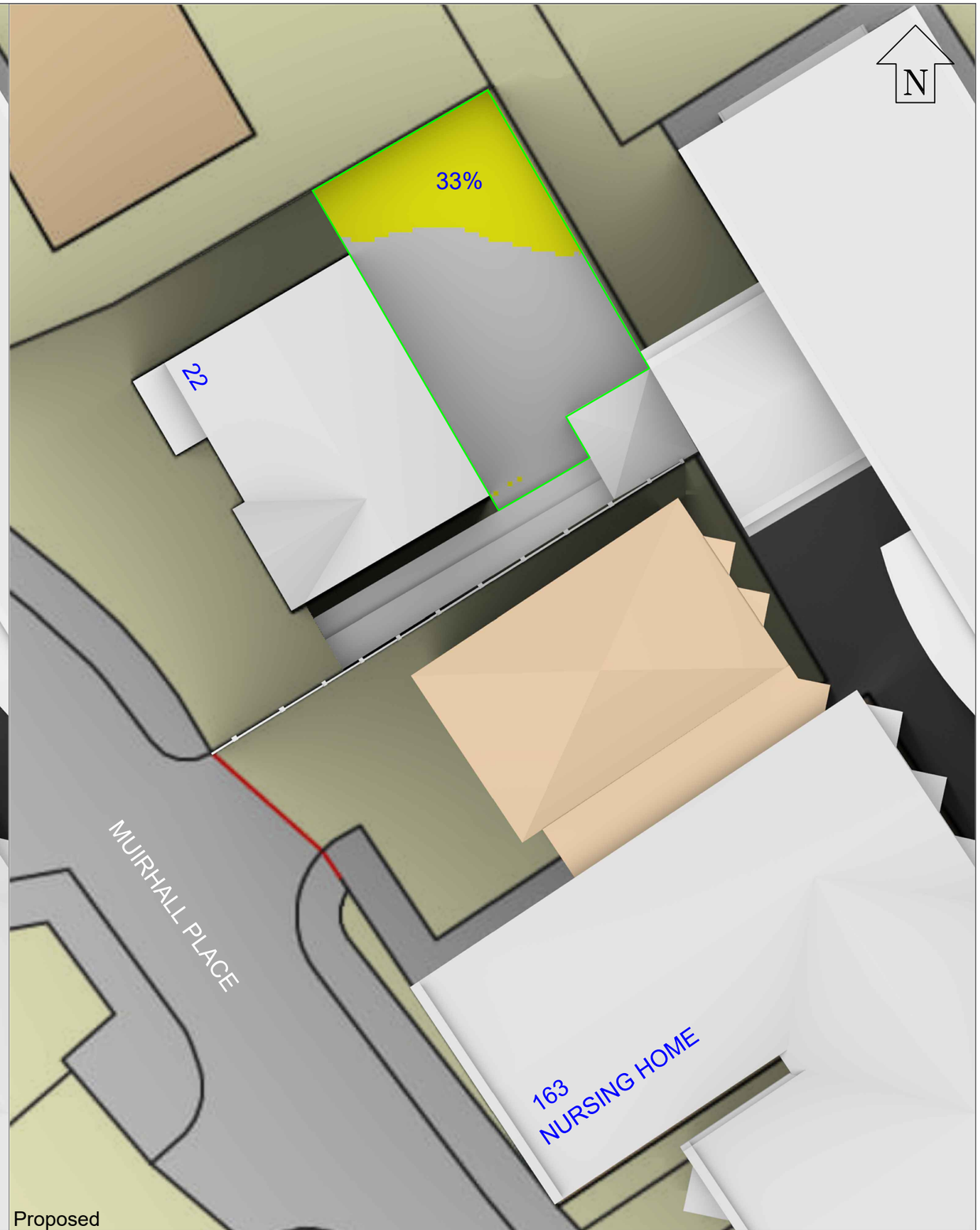

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Proposed Info (received 31/10/23)
Pre(3)130 Section Opts.pdf

Key:
- Area analysed
- Area with more than 2 hours of direct sunlight
- Area with less than 2 hours of direct sunlight
- 50% Percentage of area with more than 2 hours of direct sunlight

Project: Dreghorn
Scotland

Drawing Title: BRE 2hr Sunlight Test
Existing vs Proposed Scheme received 31/10/23

21st March

Drawn By: TP

Date: Nov 23

Scale: 1:200 @ A3

Drawing No: W1349_SHA_04

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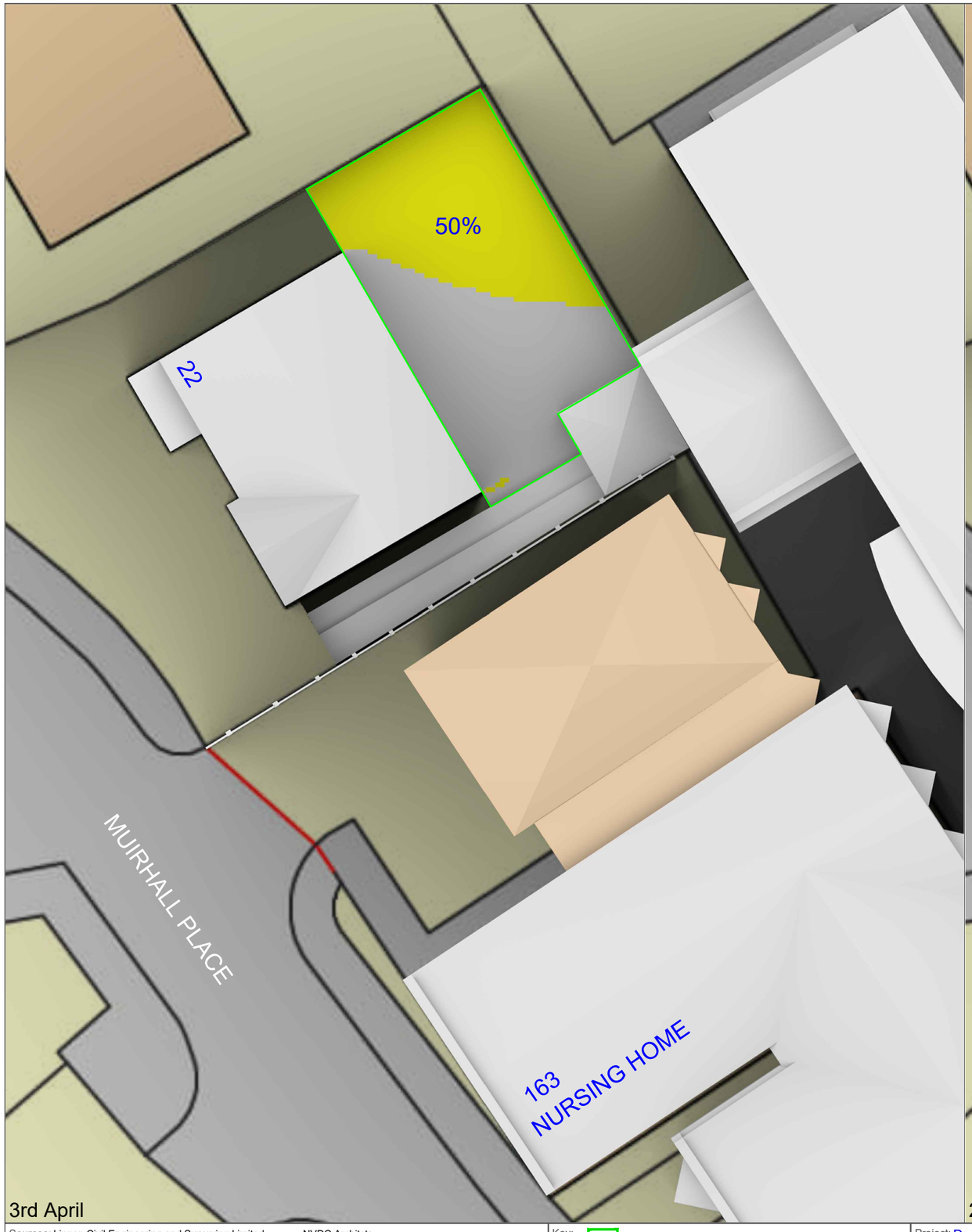
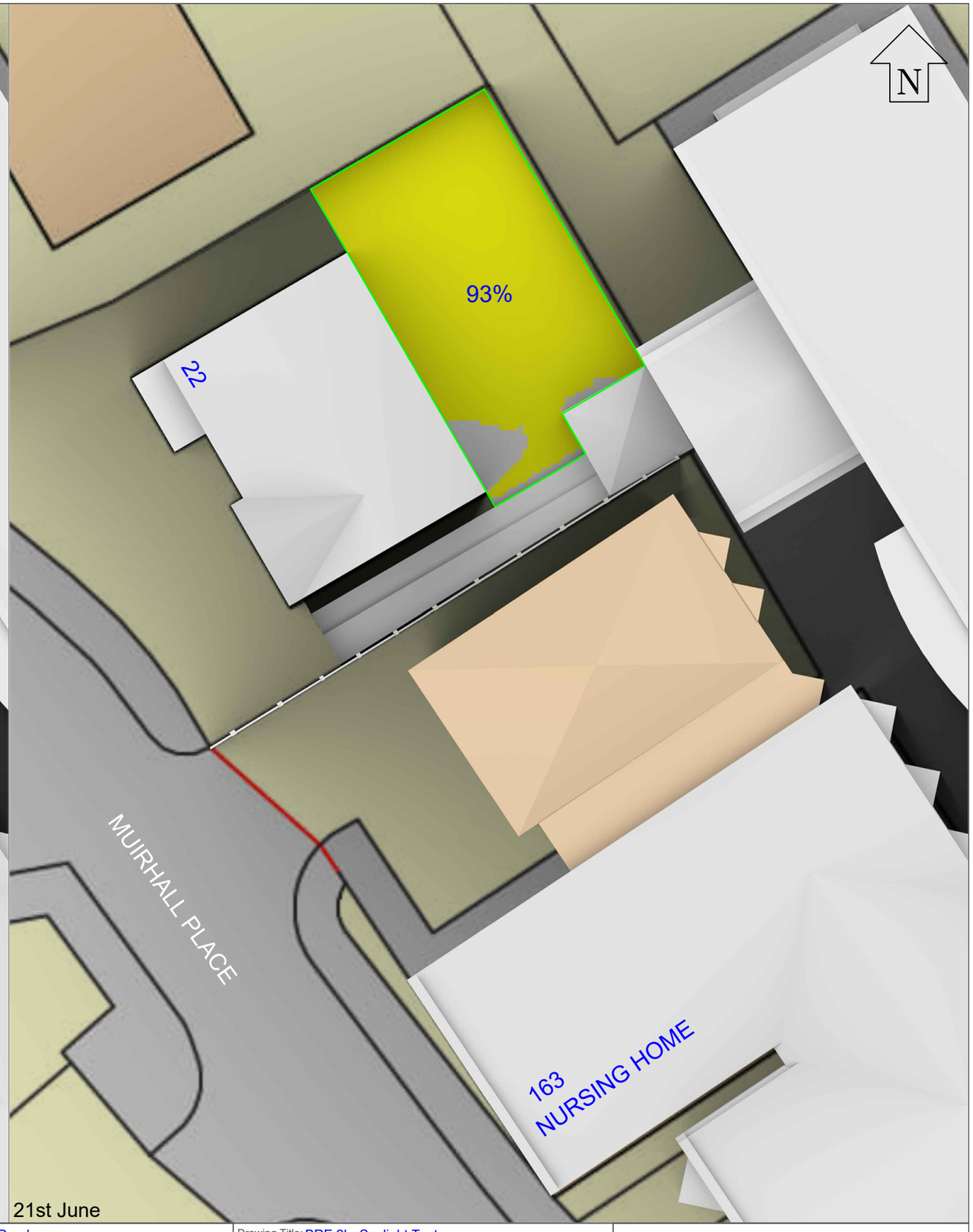


3rd April



21st June

Sources: Linnen Civil Engineering and Surveying Limited
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Key:
- Area analysed
- Area with more than 2 hours of direct sunlight
- Area with less than 2 hours of direct sunlight
- 50% Percentage of area with more than 2 hours of direct sunlight

Project: Dreghorn
Scotland

Drawing Title: BRE 2hr Sunlight Test
Proposed Scheme received 31/10/23

Calculated for the 3rd of April and 21st June

Drawn By: TP | Date: Nov 23 | Scale: 1:200 @ A3 | Drawing No: W1349_SHA_05

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Location			Vertical Sky Component (VSC)			No-Sky Line (NSL)				Annual Probable Sunlight Hours (APSH) (room)			
Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	Reduction Factor	Whole Room	EXISTING sq ft	PROPOSED sq ft	Reduction Factor	Existing Winter %	Annual %	Proposed Winter %	Annual %
22 MUIRHALL PLACE													
R1/10	Living room	W1/10	24.5	22.8	**0.93**	261.7	215.3	214.6	**1.00**	9	54	6	30
R1/10		W2/10	23.4	10.6	**0.46**								

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