

Rooftop Solar PV Feasibility Study

Shears Green Junior School –

Northfleet Schools Cooperative Trust

Date: 08/04/2026
Author: Genty Oliver – Project Manager
Verified by: Andy Tanner – Solar Service Lead

FEASIBILITY STUDY – SHEARS GREEN JUNIOR SCHOOL 3

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FEASIBILITY STUDY – Shears Green Junior School

1.0 EXECUTIVE SUMMARY

LASER Energy have been commissioned to assess the viability of a Rooftop Solar PV system to Northfleet Schools Cooperative Trust.

This project will form part of the Trust's driver to deliver to international, national and regional targets and its aspirations to reduce carbon emissions. Solar PV offers an excellent opportunity for on-site renewable energy that will not only reduce carbon emissions but also reduce on going utility bills meaning our client can focus scarce resources on their core activities.

This feasibility report outlines the key considerations for the installation of a 54kWp System to the Shears Green Junior School, across three roofs.



1.1 RIGHTS OF USE

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2.0 SURVEY INFORMATION

- Name: Shears Green Junior School
- Address: White Avenue, Northfleet, Kent DALL 7JB
- Surveyor: Stuart Cawse / Genty Oliver
- Visit Date: Thursday 19th March 2026

2.1 SCOPE AND LIMITATIONS

The inspection was non-intrusive and therefore no finishes or items of furniture were removed.

A visual inspection was undertaken of relevant exposed and readily accessible internal and external elements of the property.

We have not inspected parts of the structure or finishes that were unexposed or were inaccessible. We were therefore unable to confirm that such parts are free from wet rot, dry rot, woodworm or any other form of defect.

We have not tested any services or installations, and all findings relate to a visual inspection only. We draw to your attention to the fact that there always remains a risk of more defects becoming apparent during the installation.

We have not inspected the property for deleterious materials such as asbestos and should the client wish this to be considered, a specialist will have to be commissioned as this is outside the remit of our services.

3.0 PROPOSED ROOFTOP SOLAR PV LAYOUT



Image 1 - Proposed PV Layout (Satellite View)

Roof 3

Roof 1 (Main Hall)

Roof 2

3.1 ANTICIPATED SYSTEM SIZE

- 54 kWp
- 120 x 450 Watt Panels

4.0 ROOF SUMMARY

○ ROOF 1 – Main Hall Roof

4.1 DETAILS

- Roof type(s): Pitched Felt
- Orientation: East / West
- Height: Approx 4m/5m
- Current Access: See Section 6.10
- Obstructions: None

Roofs 2 & 3

- Roof type(s): Flat Felt
- Orientation: South
- Height: Approx 4m/5m
- Current Access: None
- Obstructions: Chimney Flues

4.2 PHOTOGRAPHS



Image 2 – Roofs 2 & 3 note roof vents obstructions



Image 3 – Roof 1 View from East, with shading from tree



Image 4 – Roof 1 view from West

4.3 ROOF STRUCTURE

BMG Surveys LTD attended on Monday 23rd March 2026 to conduct a structural survey. The report has been returned, and the following has been supplied:

Roof 1 – Main Hall:

“From the calculations, we see that the combined system & ballast (0.27kN/m2) + snow load (0.32kN/m2) = (0.59kN/m2) is less than or equal to the design-imposed load of 0.75kN/m2. We are able to confirm these loadings to be acceptable, therefore the proposed solar panels can safely be installed onto the existing roof structure with no strengthening works being required.”

Roof 2:

“From the calculations, we see that the combined system & ballast (0.24kN/m2) + snow load (0.32kN/m2) = (0.56kN/m2) is less than or equal to the design-imposed load of 0.75kN/m2. We are able to confirm these loadings to be acceptable, therefore the proposed solar panels can safely be installed onto the existing roof structure with no strengthening works being required.”

Roof 3:

“From the calculations, we see that the combined system & ballast (0.22kN/m2) + snow load (0.32kN/m2) = (0.54kN/m2) is less than or equal to the design-imposed load of 0.75kN/m2. We are able to confirm these loadings to be acceptable, therefore the proposed solar panels can safely be installed onto the existing roof structure with no strengthening works being required.”

5.0 ELECTRICAL SUMMARY

5.1 ELECTRICAL INTAKE / SUPPLY CONNECTION DETAILS

- Main Incomer Size: 200 amp 3 phase
- Meter Location: Headteachers Office G.011
- Meter Type: Elster Digital
- MPAN Number: MPAN 1900049119124
- Export Functionality Unknown

5.2 SOLAR PV(S) POINT OF CONNECTION #1

○ Electrical Cupboard (G.018)

- | | |
|-------------------------------------|---|
| • Point of connection (PoC) for PV: | Electrical Cupboard (G.018), adjacent the Main Hall |
| • PoC board name: | DB6/1 |
| • Feeding switch size: | 200 Amps |
| • Board manufacturer: | Eaton |
| • Spare Ways Available: | Yes |
| • CT Ratio: | N/A |

5.3 PHOTOGRAPHS

○ LOCATION #1

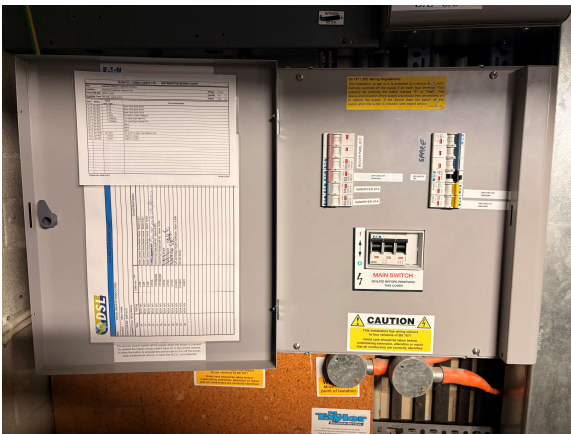


Image 5 – DB6/1



Image 6 – Electrical Cupboard, G.018



Image 7 – Meter Room



Image 8 – Main Intake

5.4 DISTRICT NETWORK OPERATOR (DNO)

A pre-project discussion has been requested with UKPN (on 08/04/2026) to establish the viability of connection to the grid. During the discussion, the UKPN will investigate the supply of the building to determine that the proposed Solar system can be allowed.

No response from the UKPN regarding a date of the meeting has been confirmed at this stage, and therefore we will update the client accordingly.

5.5 POTENTIAL INVERTER LOCATION(S)

○ Roof (External)

The inverter is proposed to be located externally at roof level (adjacent the access point for Roof 1) with these locations shown within Appendix A: Floor Plans and Locations.

The contractor should ensure the inverter is IP rated and protected from external factors, consequently improving the performance and longevity.

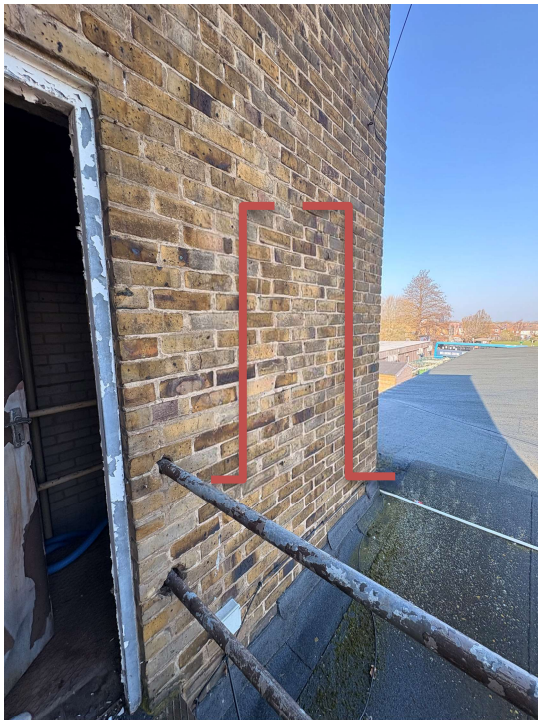


Image 9 - Proposed Position



Image 10 - Proposed Position

○ Plant Room (Internal)

Internal wall space was identified in the Plant Room, however the internal option is less feasible due to identified ACM (Asbestos Containing Material), also referenced in Section 6.8. The ACM adds a risk of additional costs for an installation to take place in this area.

Internal inverter installations also require checks and approval from the building's insurers and in some cases, external can be more favourable, depending on the insurer.

The contractor is required to ensure the Inverter is installed with enough clearances stipulated within the manufacturer's guidelines.

5.6 POTENTIAL DC CABLE ROUTES (MODULES TO INVERTER)

No fixed locations have been selected for DC cable routing, and final positioning will form part of the Contractor's design requirements.

Where cable routes are taken through walls, the installation contractor will be required to ensure that any routes include suitable fire stops in place with appropriate remediation.

Consideration will be made with respect to the potential for asbestos content materials (ACM) in areas marked 'no access' on the site's asbestos management report. Where possible, cable routing will avoid these areas, or reassurance testing carried out to ensure any disturbed materials are asbestos free.

5.7 POTENTIAL AC CABLE ROUTES (INVERTER TO P.O.C)

The proposed external inverter location is as stated in Section 5.5, and indicated in Appendix A - Location Plans & Layout

The proposed location is intended to minimise the distances of AC cabling required. Final positioning of the cable routes will form part of the Contractor's design requirements.

G.018



Image 11 – Existing Cable Run from Electrical Cupboard G.018

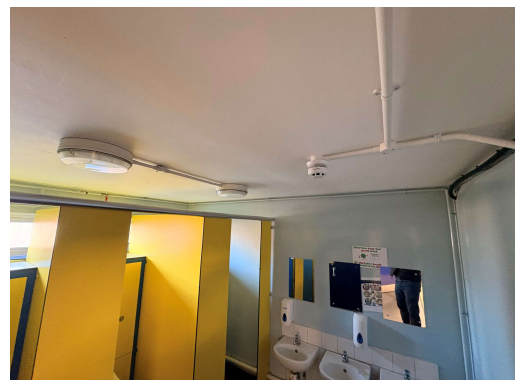


Image 12 - Boys WC (Potential AC Cable Run from Internal to External)

6.0 ADDITIONAL CONSIDERATIONS

The school have advised that Electric Vehicle Chargers (EV) are planned to be installed ahead of the proposed solar PV works. Although no date is yet confirmed, should the EV installation take place during this time, this could influence some of the electrical design for the PV works.

There is a possibility for EV connections to be made into the same Distribution Board (advised in Section 5.2), resulting in the spare ways no longer being available, and consequently changing the preferred point of connection and/or cable routes.

6.1 ROOF CONDITION

Some of the main building roofs is worn and the surveyor noted elements of ponding. We were not made aware of any leaks or damage from the roof(s) at the time of survey.

6.2 SHADING

It is advised that an optimised system is installed, which will reduce the impact from any shading that may occur, along with its increased benefits such as individual monitoring and safety features.

6.3 LOCAL PLANNING

Due to the system size, a prior approval will be sought from the local planning authority to determine any ancillary planning requirements that must be achieved beyond the requirements of Permitted Development.

6.4 FIRE PROTECTION

The solar PV system should be integrated into the active fire alarm system contained within the building. This will enable the system to be automatically isolated in the event of an emergency.

A cut-off isolator switch-relay is to be connected at main entrance lobby, to ensure safe-disconnection of the system in the event of an emergency and therefore should be visible as close as possible to the fire alarm panel which would need to be accessed by emergency services.

The contractor will be required to adhere to the RISC Authority RC62: Recommendations for fire safety with PV panel installations, the Joint Code of Practice for fire safety with photovoltaic panel installations, with focus on commercial rooftop mounted systems.



6.5 LIGHTNING PROTECTION SYSTEM (LPS)

There was no evidence on the roof that the building is currently connected to a LPS system.

It is advised that a risk assessment is conducted to ensure that the proposed system is fully compliant with regulations, whilst the solar system should also have AC and DC surge protection installed.

6.6 DATA CONNECTION

For remote monitoring, the proposed system will need to be connected online. This can either be achieved via a GSM or connecting to the buildings network system.

6.7 DISPLAY

A visual display screen may be provided at the main centre reception, based on the client's decision, which can display figures of instantaneous power production from the inverters live-feed monitoring system. Additional benefits may be to provide further education to the

public utilising installation photos, details of policies and the contribution to Northfleet Cooperation Trust's Carbon strategy.

The requirements for the level of detail for this display will need to be confirmed by the client and where required may need additional engagement with their ICT maintenance provider to ensure relevant connections and data points are available, if mobile data/GSM signal is insufficient.

6.8 ASBESTOS

The client has provided a copy of their Asbestos Management Report for review.

Asbestos is confirmed in various areas of the site, internally and externally. Main areas for concern or to highlight at this stage would be the External cement soffit panels and Boiler Room G.017 wall surfaces, where Chrysotile is presumed.

The successful contractor will need to reference the Asbestos Management Report and demonstrate reasonable provision to undertake the works whilst avoiding disturbance/damage to these items.

6.9 INSURANCE

The client is required to verify with their insurers any additional requirements beyond those of statutory and regulatory standards, such as the location and protection of inverters and the requirements for an emergency Fire cut-off switch.

6.10 ACCESS

Main Hall - Roof 1

There is access to Roof 1 via Store Room G.019, which has a fixed ladder in place. The client should ensure the ladder is regularly checked and maintained.

The access point however has metal railings surrounding which would need to be extended and a gate added to accommodate access to the inverter and modules.

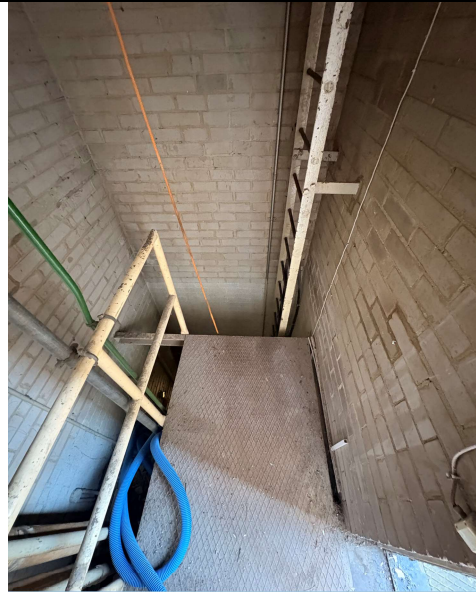


Image 14 – Ladder within G.019



Image 15 – Metal Railings on Roof 1 access point

Roof 2 & 3

There is currently no access noted to either Roof 2 or 3.

6.11 TEMPORARY STORAGE / COMPOUND AREA

A location for the contractor's storage and compound area will be provided and is currently anticipated as the School Car Park. This is marked in the Site Locations in Appendix A.

6.12 VEHICLE ACCESS

There was only one vehicle access route noted on the survey, which is via the School Carpark Entrance. Parking limitations or reservations would need to be arranged with the site prior to use.

6.13 WELFARE FACILITIES

Contractor's welfare facilities will need to be provided at the site compound area.

6.14 EDGE PROTECTION

The installation project would advise for permanent edge protection to Flat Roofs 2 & 3 (see also marked-up plans in Appendix A) to ensure safe ongoing maintenance of the Solar array.

As the Main Hall Roof (Roof 1) is pitched at a lower degree, it should be considered if a permanent edge protection solution such as a Man-Safe system can also be installed for safe access.

The contractor will be required to ensure all works are carried out in a safe manner, aligned with the CDM regulations and set out in detail in the contractor's Construction Phase Plan (CPP) and accompanying Risk Assessment and Method Statements (RAMS).

Without Permanent Edge Protection, the client will incur scaffolding/access costs for every maintenance visit which may become more expensive as a long-term solution.

6.15 SCAFFOLDING

It is expected that scaffolding will need to be erected at each roof, as indicated in Appendix A, although final positions will be agreed with the installation contractor during project planning and should not interfere with emergency exits.

It is anticipated that works would take place during a school holiday period and therefore general site operations shouldn't affect the location of scaffolding, however considerations for holiday club bookings or similar should be made.

There will be requirement for the contractor to utilise loading platforms to bring the Solar PV modules to each roof. Proposed locations for these are marked on the plans in Appendix A:

6.16 SITE OPERATION HEALTH AND SAFETY REQUIREMENTS

The site is an operating school so additional health and safety requirements need to be considered with reference to the protection of staff and pupils. It is anticipated that the works will be undertaken during holiday periods with dates to be agreed with installation contractor and school. However, if young people are on site during any of the installation then the contractors should hold and present their current enhanced DBS checks to the client.

7.0 BUDGET ESTIMATES

7.1 SCHEDULE

Following the assessment of the works the following schedule of recommended works and budget estimate is provided. The estimated contractor prices have been updated on 19th September 2025, based on a review of recently tendered projects:

Proposed System Size		54.0 kWp
Proposed Battery Storage		£ - kWh
Estimates		
Price per kWp		£ 1,450.00
Supply & Installation		£ 60,381.82
Permanent Access & Protection		£ 10,800.00
Battery Storage		n/a
Estimated Contractor Works		£ 71,181.82
Contingency	10%	£ 7,118.18
Sub Total		£ 78,300.00
Planning Fees		£ 340.00
LASER Fees - Feasibility & Survey		£ 6,000.00
LASER Fees - Procurement	Fixed	£ 5,400.00
LASER Fees - Project Management	10.0%	£ 7,830.00
Project Total		£ 97,870.00

7.2 SUMMARY

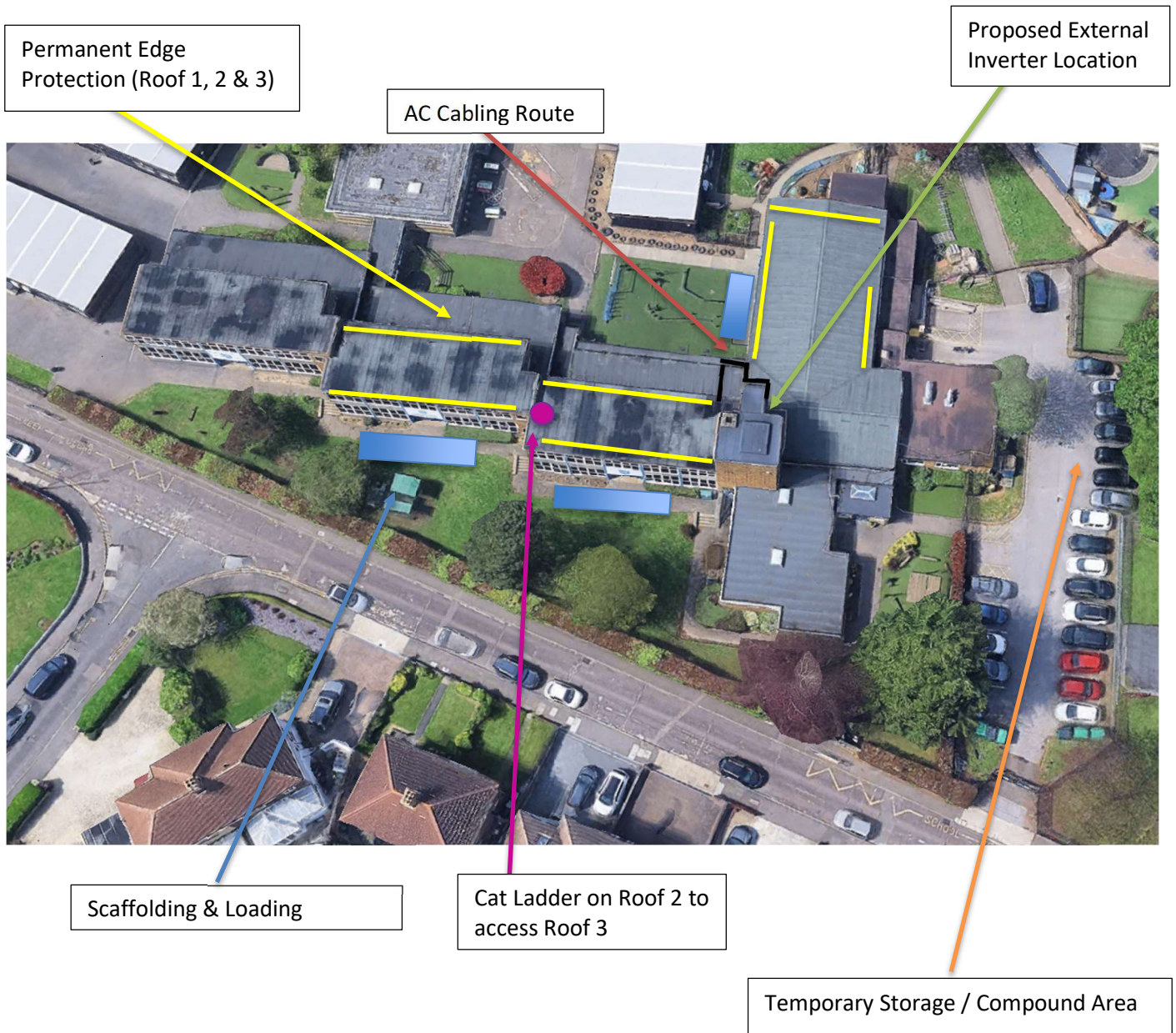
The estimated cost of the proposed project including all fees would be **£97,870.00** (excluding VAT) to be completed within a 12 week contract period, based on recently tendered projects of similar scope.

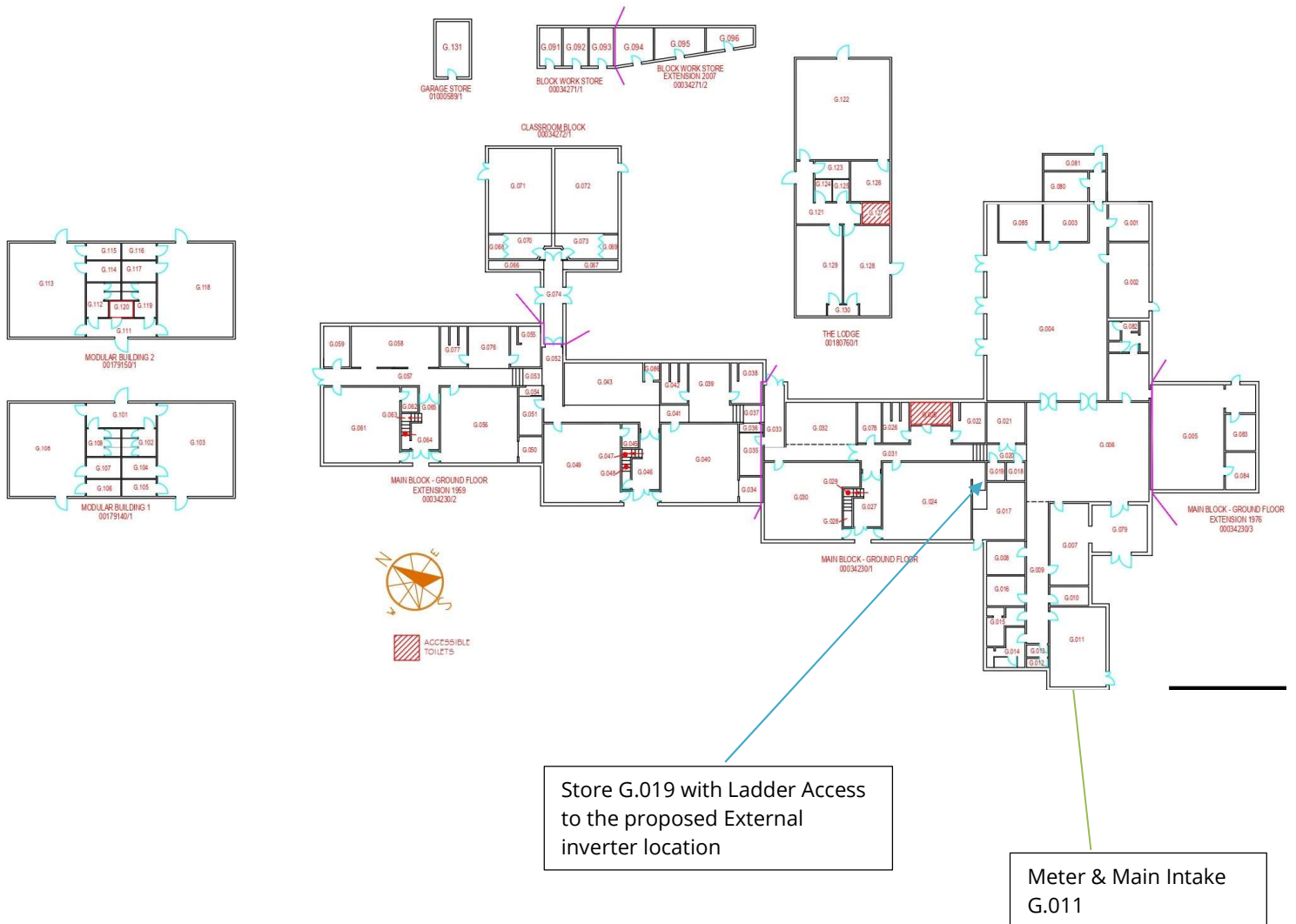
The above figures are exclusive of VAT, Building Authority Fees, and Specialist Consultant Fees. The prices are based on works starting on site within 90 days of the tender return and are subject to Competitive Tendering by traditional procurement methods which will verify the current market cost.

The estimates assume that contractor selection will reflect the scope & nature of works and geographical locations of these works relative to the contractor's base. Please note that the above figures include a suggested contingency sum, and that the estimated price per kWp is based on a range of completed projects. The level of contingency sum used will vary between actual installations and therefore tendered sums may be slightly higher where the value of contingency sum remains unknown.

8.0 APPENDIX A

8.1 FLOOR & LOCATION PLANS





8.2 SOLAR SIMULATION RESULTS



8.3 SOLAR SIMULATION RESULTS

Roof covering	Felt
Orientation	East / West & South
Module Number	~ 120 x 450W all black modules
Module Size (Watts)	450W
System size (kWp)	54 kWp
Solar output (kWh/year)	Approx. 51,930 kWh per year
Approx install cost range (Includes PM Fees) Based upon	Between £93k to 103k
Approx cost assumed calculations (£)	Assume £97,900 for calculations
Energy currently consumed on site (kWh) (Actual/Estimated)	121,830
Potential savings (Electricity use and Export)* <i>Estimated export is sold to your supplier through the Smart Export Guarantee – this rate ranges between suppliers and is currently between 3p – 16.5p / kWh.</i>	* 51,930 kWh x 81% x £0.28 = £11,778 / year savings
	* 51,930 kWh x 19% x £0.10 = £987 / year income from export
	TOTAL SAVINGS = £12,764 / year
Average cost of each kWh of solar electric over the 25 year lifespan <i>On going maintenance cost and cleaning are not included in these calculations.</i>	£97,870 / (51,930kWh x 25 years) = 8p / kWh
Total savings over 25 years <i>On going maintenance cost and cleaning are not included in these calculations. Assumed constant electricity price over next 25 years.</i>	£319,100
Approx financial payback	£97,870 divided by £12,764.39 = 7.7 years
Carbon saving - Using latest Government emission factor of 0.207KgCO ₂ e/ kWh from grid electricity.	51,930 kWh x 0.207kg = 11 Tonnes of CO ₂
Equivalent to absorption from: <i>a tree can store about 25 kg of CO₂ per year - https://ecotree.green/en/how-much-co2-does-a-tree-absorb</i>	401 trees/year