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Letchworth Sports and Tennis Club
Muddy Lane
Letchworth
Hertfordshire
SG6 3TB

Attn: Ms M. Loten

manager@lstc.org.uk

Our Ref: 24457/JL/PL

Date: 09 December 2024

Dear Mel,

Re: Letchworth Sports and Tennis Club, Muddy Lane, Letchworth SG6 3TB

We visited the above property, at your request, on 29th October 2024 to undertake a structural survey as it is proposed to install PV panels to the roof.

Our inspection was visual only and no opening up works were undertaken.

Survey

The club is constructed with full span Glulam portal frames, with purlins and rafters supporting a slate tile roof.

The underside of the structure was viewed and there was no evidence of distress or distortion noted. All timber members appeared of suitable size.

Discussion

The proposed panels are JAM54-40-435-GB-TSMCH and will be Fastensol Rail mounting system. This is a direct fixing system and no ballast is required.

The panels weigh 21.5kg each.

Calculations have been undertaken using the proposed loads in comparison with the design loads.

The roof dead load will remain the same and the offset is made against the imposed load.

We have used the expected original design Imposed Load for the roof (0.6kN/m^2) and calculated the snow load for the building. A design snow load of 0.32kN/m^2 has been calculated.

In areas of PV panels there will be no personnel load, and the calculations show the design load, less snow load (0.28kN/m^2) is greater than the PV panel load (0.111kN/m^2).

Conclusion

For this roof top installation all PV panels and mounting system as described are within the design load and the installation is considered acceptable.

We trust the report is clear. However, if you have any queries, please contact the office.

Yours sincerely,

HLS Structural Engineers Ltd



Julie Littlemore

MEng (Hons) BA (Hons) CEng MStructE FGS

Contract: Letchworth Sports and Tennis Club, Muddy Lane

PV panel Installation

Design check using
direct fixing.

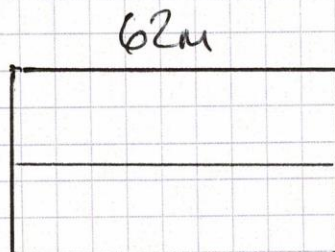
• Panel Details JAM54B-40-435-GB-TS-MC4

@ 21.8kg (1.722m x 1.134m) $\Rightarrow$ 0.11 kN/m²

rail - Fastenor Rail 0.58kg/m. $\Rightarrow$ 0.01 kN/m²

0.111 kN/m²

• snow load



100m above sea level

48m 15° pitch (fixed roof)

Refer to following Tedds analysis.

max uniform snow load = 0.32 kN/m²

• original design loadings

Building construction 2005 (glulam frame, purlins & h't's)
(BS6399 Pt.3 1988)

roof with no access (only cleaning & maintenance)

IL = 0.60 kN/m² (slope 30° or less)

Where PV panels are installed no IL (no access)

$\therefore$ Design load - snow load

$$= 0.6 - 0.32 = 0.28 \text{ kN/m}^2$$

0.28 > 0.111 (panel + rail load) $\therefore$ panels ok
(direct fixing)

 HLS HORNE & LITTLEMORE STRUCTURAL ENGINEERS HLS Structural Engineers Ltd 25 Brownfields Welwyn Garden City Herts AL7 1AN	Project				Job no.	
	Letchworth Sports and Tennis Club, Muddy Lane, LGC				24457	
	Calcs for				Start page no./Revision	
	Snow Load				2	
Calcs by	Calcs date	Checked by	Checked date	Approved by	Approved date	
JCL	DEC 2024					

SNOW LOADING TO BS6399:PART 3:1988

TEDDS calculation version 1.0.03

Site location

Location of site

Oxford

Site altitude

A = 100 m

Calculate site snow load

From BS6399:Part 3: 1988 - Figure 1. Basic snow load on the ground

Basic snow load

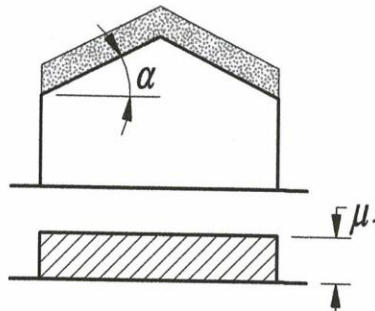
$$S_b = 0.40 \text{ kN/m}^2$$

$$S_{alt} = 0.1 \times S_b + (0.09 \text{ kN/m}^2) = 0.13 \text{ kN/m}^2$$

Site snow load

$$S_0 = \max(S_b, S_b + S_{alt} \times (A - (100 \text{ m})) / 100 \text{ m}) = 0.40 \text{ kN/m}^2$$

BS6399:Part3:1988 Cl.6.2



Uniform loading

Roof geometry

Roof type

Pitched

Distance on plan from gutter to ridge

b = 24.000 m

Angle of pitch of roof

alpha = 15.0 deg

Calculate uniform snow load

From BS6399:Part 3: 1988 - Figure 3. Snow load shape coefficients for pitched roofs

Snow load shape coefficient

$$\mu_1 = 0.80$$

Uniform roof snow load

$$S_{d1} = \mu_1 \times S_0 = 0.32 \text{ kN/m}^2$$

BS6399:Part3:1988 Cl.5

Roof pitch alpha is not greater than 15 degrees so there is no asymmetric loadcase

Snow sliding down roof

Maximum uniform snow load on roof

$$S_{d_max} = 0.32 \text{ kN/m}^2$$

Force from sliding snow load

$$F_s = S_{d_max} \times b \times \sin(\alpha) = 1.99 \text{ kN/m}$$

BS6399:Part3:1988 Cl.8