

12a Rectory Avenue, Prestwich SuDS Drainage Calculations

SuDS Drainage Calculation Summary -

Site: Replacement dwelling - surface water management in accordance with BRE digest 365 and SuDS principles

Requirement: Demonstrate that post-development surface water discharge is restricted to the existing (pre-development) runoff rate with a minimum 40% reduction to account for climate change.

1. Areas

- Existing impermeable area: 119 m²
- Proposed impermeable area (roof only - driveway permeable): 89 m²
- Proposed roof area is approximately 32% less than existing, reducing overall runoff compared to pre-development

2. Permeable Driveway (Infiltrating)

The driveway will be constructed using permeable paving over a graded stone sub-base (Type 3 or 4). This provides temporary attenuation and promotes infiltration into the underlying ground. The design follows the principles of BRE Digest 365 (Soakaway Design).

Infiltration Assumption:

The site contains sandy fill material, (new walls foundation has been piled to this poor ground) which typically provides good infiltration characteristics. A conservative infiltration value may be adopted for planning-level submissions where full BRE 365 testing is not required at this stage.

3. Design Storm

1-in-100 year, 6-hour storm event with +40% climate change uplift

- Baseline rainfall depth: 60 mm
- Climate-adjusted depth: 84 mm (0.084 m)
- Duration: 6 hours (21,600 s)

4. Pre-Development Runoff (Q_{pre})

- Runoff coefficient $C = 0.9$
- Intensity $i = 0.084 / 21600 = 3.889 \times 10^{-6} \text{ m/s}$
- $Q_{\text{pre}} = 0.9 \times 3.889 \times 10^{-6} \times 119 = 0.417 \text{ L/s}$

5. Allowed Post-Development Discharge

- Required reduction: 40%
- $Q_{\text{allowed}} = 0.60 \times Q_{\text{pre}} = 0.25 \text{ L/s}$

6. Post-Development Inflow Volume

- Only roof area contributes runoff (driveway infiltrates).
- $V_{\text{inflow}} = 89 \times 0.084 = 7.48 \text{ m}^3$

7. Permitted Discharge Volume

- $V_{\text{allowed}} = Q_{\text{allowed}} \times 21600 = 5.40 \text{ m}^3$

8. REQUIRED ATTENUATION STORAGE

- $S = 7.48 - 5.40 = 2.08 \text{ m}^3$

9. DESIGN CONCLUSION

- Maximum discharge to existing manhole: 0.25 L/s
- Minimum attenuation required: 2.1 m^3
- Permeable driveway designed in accordance with BRE Digest 365 provides infiltration and source control.
- Only roof water is discharged, ensuring site runoff is reduced by more than 40% compared to pre-development.
- Proposed roof area is 32% smaller than the existing roof/hardstanding combined, so this calculation is conservative

10. Consider Permeable paved area required for 2.1 m^3 to act as temporary attenuation and infiltration storage

- Available 116 m^2 therefore
- Required depth of graded subbase = $2.1/116 = .018 \text{ m}$
- For conservative value 30% void ratio of granular subbase = $.018/0.3 = 0.06 \text{ m}$ which 60mm dp as minimum depth

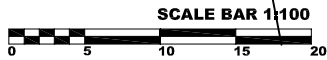
Calculations By,

Nabil Karim

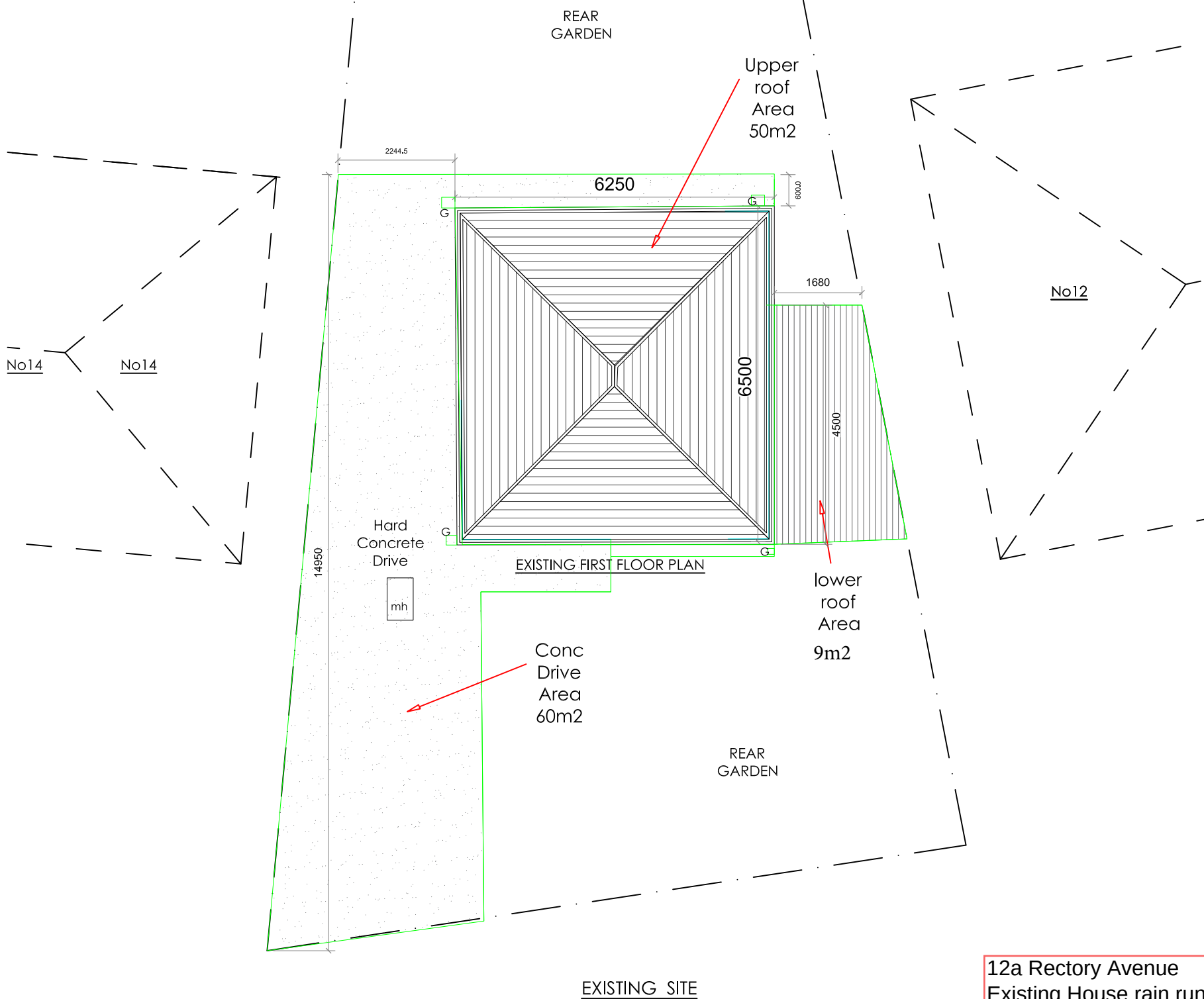
Structural and building design Engineer

C Eng MStructE

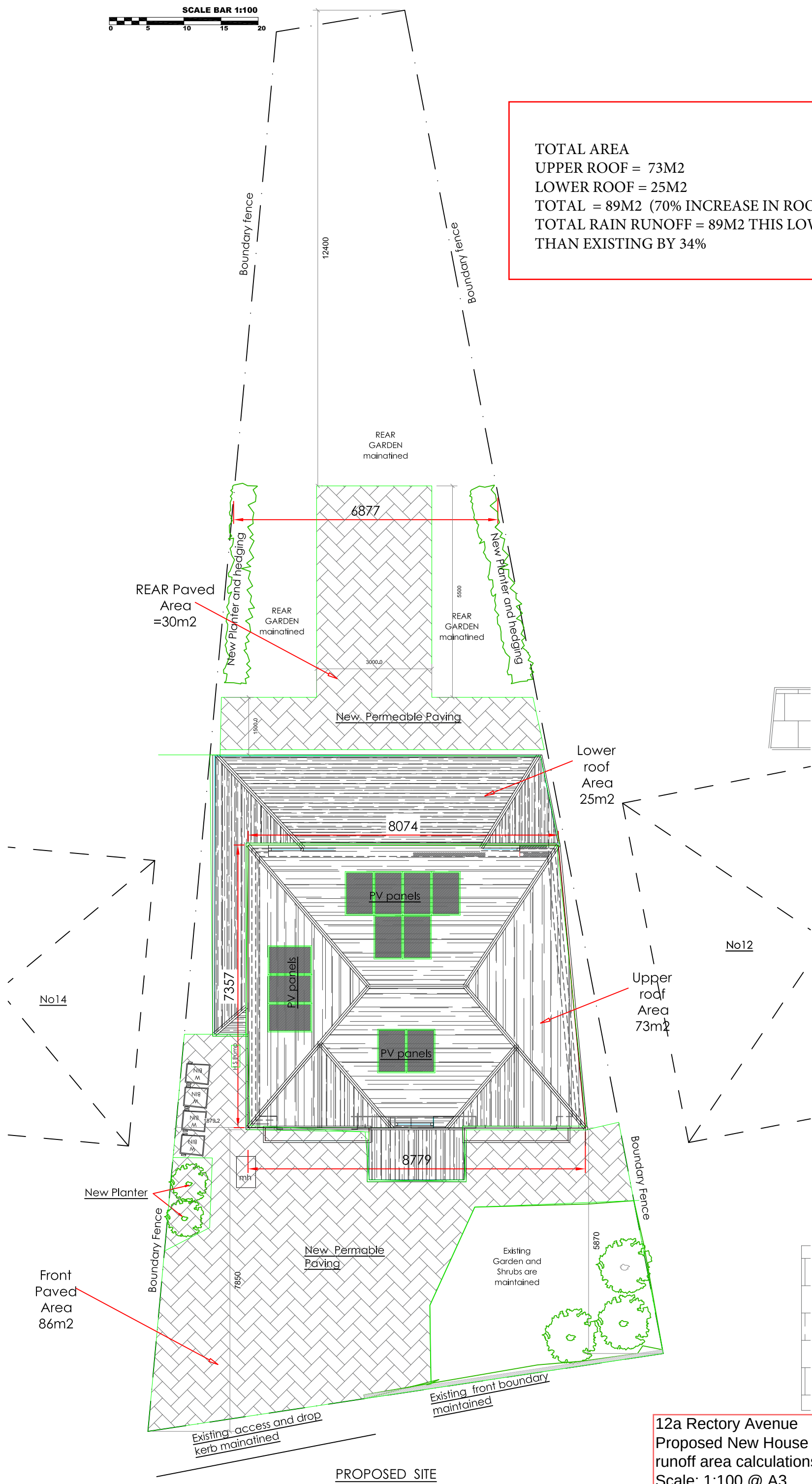
07753620457



TOTAL AREA
UPPER ROOF = 50.0M2
LOWER ROOF = 9m2
TOTAL = 59M2
HARDSTANDING AREA = 60M2
tOTAL RAIN RUNOF AREA =
59+ 60 = 119M2



12a Rectory Avenue
Existing House rain runoff
area calculations
Scale: 1:100 @ A3



TOTAL AREA
UPPER ROOF = 73M2
LOWER ROOF = 25M2
TOTAL = 89M2 (70% INCREASE IN ROOF AREA)
TOTAL RAIN RUNOFF = 89M2 THIS LOWER
THAN EXISTING BY 34%

12a Rectory Avenue
Proposed New House rain
runoff area calculations
Scale: 1:100 @ A3