



# Solar Farm Drainage Strategy Advice

## Solar Farm Drainage

The drainage strategy is important to consider at an early stage of the planning process for solar farms. Solar farms can create increased concentration of surface water and intensify erosion in-between the rows of solar panels. Flow channels could potentially occur and lead to an increased surface water peak runoff rate and runoff volume.

## Lead Local Flood Authority (LLFA) advice for solar farm drainage strategy

1. All solar farm applications should provide a drainage strategy as well as a land management strategy. These are crucial when assessing the flood risk associated with these sites.
2. The drainage hierarchy should still be applied to solar farms, infiltration is the preferred drainage design.
3. Developers need to consider the vegetation on the ground below solar panels. When the ground is sufficiently vegetated and maintained, solar panels are less likely to have a significant impact on runoff rates and runoff volume.
  - Minimise vegetation disturbance during construction.
  - Re-vegetate as soon as possible after construction to establish and maintain good ground cover across the site.
  - Fence the site if needed, to avoid disturbance from livestock and ensure that vegetation can be maintained on the site.
  - Create a maintenance plan, which includes conducting regular inspections of the site over the developments lifetime to ensure that vegetation cover is adequate, and no flow channels are generated. The plan should take into account that remedial work may be required if the vegetation is no longer acceptable.
  - Remedial work should occur as soon as possible.
4. Developers must consider the soil type and slope angle of a proposed site, as these factors also influence surface water runoff.
5. Less favourable conditions may require the installation of bunds or infiltration strips and basins.
6. Where reasonably possible, solar panel rows should be arranged parallel to site's contours. A perpendicular arrangement may worsen flow channels and soil erosion.
7. Use of heavy machinery (trucks, diggers etc.) during construction may lead to soil compaction in some areas. To mitigate this, soil may need to be chisel ploughed (or similar) to ensure that the soil will infiltrate at pre-construction level.

8. Once construction has been completed, vehicular movements on site should be restricted to designated access tracks to reduce the risk of soil compaction.
9. If a proposed solar farm is near a watercourse, a swale feature should be incorporated into site design to ensure runoff is intercepted and stored before entering downstream watercourses.
10. Any proposed swales should be designed in accordance with the CIRIA SuDS manual using the long-term storage equation specifically addressing the additional runoff caused by a development.
11. If a proposed solar farm is to be located in flood zone 2 or 3, all panels and additional items e.g. electrical connectors etc. should be located above the maximum predicted flood depth plus a 0.6m freeboard.
12. If a proposed solar farm is to be located within an area at risk of surface water flooding, all panels and additional items e.g. electrical connectors etc. should be located above the maximum predicted flood depth plus a 0.3m freeboard.
13. Any impermeable areas e.g. access roads, substations etc. need to be accounted for in the drainage strategy.
14. Any proposals for works within 10m of a watercourse or alterations to existing watercourses (as defined by the Land Drainage Act 1991) will require consent from the relevant Land Drainage Authority.
15. It should be noted the City of Doncaster Council have an anti-culverting philosophy (Local Plan).

For further advice on drainage strategies, please see the City of Doncaster Councils Local Plan, the SY interim guidance for Suds, the Flood Risk SPD and the Technical and Developer Requirements SPD to ensure you have supplied sufficient drainage information for the planning application. The documents can be found on the websites:

[Local Plan - City of Doncaster Council](#)

<https://www.doncaster.gov.uk/services/planning/development-and-floodrisk>

<https://www.doncaster.gov.uk/services/planning/ldf-supplementary-planning-documents>