Our ref: HLEF85532 – Cottered Solar Farm

Date: 6th May 2025

LLFA Comments Response Technical Note – 3/21/2245/FUL – Land to the west of the A507 betweed Cottered and Cromer, Hertfordshire, SG9 9PU

This technical note has been prepared to provide additional information requested by the Hertfordshire County Council (HCC) acting as Lead Local Flood Authority (LLFA) in the objection letters dated 9th of January 2025 and subsequent letter dated 18th of February 2025 in regards to the installation and operation of a solar farm including co-located energy storage facilities, onsite substation, ancillary infrastructure and landscaping at Land to the West of the A507 Between Cottered and Cromer, Hertfordshire, SG9 9PU. The objections raised by the LLFA are summarised below. Copies of both letters are available in Annex A of this technical note.

This technical note should also be read in conjunction with the Flood Risk Assessment (FRA) and Sustainable Drainage Strategy document HLEF85532 v3, dated October 2024 and associated Appendices.

In the letter dated 18th of February, the LLFA has stated that whilst the submission of the appendices has removed some of their previous objections (January 2025), watercourse consent, infiltration testing, infiltration rate, simple index approach and resilience measures have not been updated in this revision. Therefore, the objections to these remain.

The LLFA object to this planning application in the absence of an acceptable Drainage Strategy relating to:

- The proposed SuDS are likely to increase the risk of flooding elsewhere.
- The development is not in accordance with NPPF, PPG or local policies.
    - Policy WAT1 - Flood Risk Management
    - Policy WAT3 - Water Quality and the Water Environment
    - Policy WAT5 - Sustainable Drainage

To prevent flooding in accordance with National Planning Policy Framework paragraphs 181, 182 and 187 by ensuring the satisfactory management of local flood risk, surface water flow paths, storage and disposal of surface water from the site in a range of rainfall events and ensuring the SuDS proposed operates as designed for the lifetime of the development.

LLFA OBJECTIONS

- *Demonstrate that any residual risk is managed with appropriate flood resistance and residual measures. Residual Risk needs to be further explored.*

- *Identification is required to those structures which require consent for works on an ordinary watercourse (from the LLFA), this extends to works required within 8m from the top of the bank (see HCC LLFA website). Confirmation is required as to whether any works will be undertaken on the watercourse.*
- *Evidence required on ground conditions / BRE365 or similar infiltration testing / dissolution potential / seasonally high groundwater levels. Infiltration testing has not been provided for viability. This should be provided.*
- *Surface Watercourse – does it connect to the wider network and is there permission and there are agreed access locations for proposed outfalls with the riparian owner? There is no in-principle agreement for connection into the River Beane in the north.*
- *The application must provide water quality benefits. Appropriate water quality assessment is absent / incorrect. Simple Index Approach has not been provided.*
- *The most precautionary infiltration rate should be used in the design of the attenuation feature. The infiltration rate has been assumed as the 'best case scenario'. The worst-case scenario rate should be used.*
- *Layout and/or drainage layout drawings need to show all the drainage features (storage and conveyance), with labels the same as those in the submitted supporting calculations. Confirmation of any formal drainage on site is required in a drawing. Currently, it is unclear as to whether formal drainage will be used on site.*
- *Drawings of cross sections and long sections of all the network and structures such as ponds, basins and swales need to be supplied. Confirmation of any formal drainage on site is required in a drawing. Currently, it is unclear as to whether formal drainage will be used on site.*
- *A high-level assessment of how water quantity and water quality will be managed during the construction phase is required. Identifying high level assumptions such as need to discharge to a sewer or watercourse with appropriate pollution measures. A high-level assessment of water quality during construction is required.*

RPS RESPONSE

Residual Risk

- Residual flood risk is managed through the implementation of resilience measures which prioritise rapid recovery and minimise damage to critical infrastructure in case of exceedance of flood flows. The FRA includes resistance and resilience measures and these are summarised below:
    - Solar panels are mounted on elevated structures that allow water to pass underneath without affecting the modules or their electrical connections.
    - All cabling will be installed above predicted flood levels, using elevated trays or poles where possible.
    - Key electrical equipment inside substations will be installed at heights above predicted flood levels.
- These measures, combined with routine inspections which will be detailed in the detailed maintenance plan at detail design stage, will enhance the resilience of solar farm infrastructure and sufficiently address residual flood risk.

Structures within 8m from watercourse

- A crossing over the ordinary watercourse is proposed to be upgraded. A drawing which includes the proposed works and the cross section is available in Annex B of this Technical Note. We understand that a Flood Risk Activity Permit (FRAP) or Land Drainage Consent would be required. The necessary permits would be applied for following planning approval and subject to consultation with the EA/LLFA at detailed design stage.

Infiltration Testing / Ground Conditions & Infiltration Rate

- Infiltration testing has not been undertaken at planning application stage because the surface water drainage strategy has been conservatively designed using a worst-case infiltration rate, assuming minimal or no infiltration potential. This approach ensures that the proposed drainage system is robust and does not rely on infiltration for effective operation, thereby eliminating any risk of under-design due to overestimation of infiltration capacity. As such, the current design presents a precautionary worst-case scenario in line with industry best practice.
- The original FRA included a typo (‘best case’ scenario) while in the Causeway Calculations available as Appendix H it can be confirmed that an infiltration coefficient close to zero was used in the storage calculations. Calculations were re-run to include no outfall and these are available in Annex C of this Technical Note. These demonstrate that the proposed gravel sub-bases for the ancillary building will accommodate the increased volumes from the proposed hardstanding at the site.
- Undertaking infiltration testing at this stage would offer limited additional value, as the strategy assumes minimal/ no infiltration potential and therefore does not depend on infiltration performance to demonstrate feasibility or compliance with planning policy. Conversely, it demonstrates that a feasible strategy can be implemented which does not rely on infiltration.

Surface Watercourse Connection

- No formal connection is proposed to the surface watercourses on site.

Simple Index Approach

- Surface water run-off should be managed by SuDS that are designed to attenuate flows and to avoid water quality impacts downstream. To demonstrate that surface water arising from the development will be appropriately treated prior to discharge, the Simple Index Approach, as outlined within the SuDS Manual (CIRIA C753) has been followed.
- As stated in the SuDS Manual 2015 (C753), the risk posed by surface water runoff to the receiving environment is a function of:
    - the pollution hazard at a particular site (i.e. the pollutant source);
    - the effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels, groundwater (i.e. the pollutant pathway);
    - the sensitivity of the receiving environment (i.e. the environmental receptor).
- The CIRIA SuDS Manual (2015) provides pollution hazard indices from an assortment of land uses and the pollution mitigation indices for a number of SuDS techniques. It is noted that the pollution hazard indices are not cumulative, and that the mitigation should be designed to the maximum pollutant use. Furthermore, it is not anticipated that there would be coarse sediments for removal at the site, therefore specific design for this purpose would not be required.
- The development is classified as sites with ‘low’ pollution hazard levels. The pollutant hazard indices for this type of development are outlined in the SuDS Manual (CIRIA C753) Table 26.2 and Table 1 below.

Table 1. Pollution Hazard and Mitigation Indices

Land Use / SuDS Feature	Total Suspended Solids (TSS)	Metals	Hydrocarbons
	Proposed Land Uses		
Other roofs (typically commercial / industrial roofs)	0.3	0.2	0.05
	Mitigation		
Gravel Subbase	0.4	0.4	0.4

- As illustrated in the Table 1 above, the identified mitigation indices (The SuDS Manual, CIRIA C753, Table 26.3) of the proposed gravel subbase exceed the maximum anticipated pollutant hazard indices. This confirms that surface water arising from the ancillary infrastructure on site will receive an appropriate level of treatment in advance of discharge from the site following natural infiltration patterns.
- The only potential source of higher pollution within the site are the transformers at the Substation site. These will be bunded, with any potential contamination held within the bund. Water captured within the bund would be extracted via a suitable qualified contractor for appropriate disposal.

Conceptual Drainage Layout Drawing

No formal drainage is proposed for the solar farm panels elements of the proposed development. The drainage strategy is described in Section 10 of the FRA report. An illustrative drawing showing the proposed measures to address the increase of impermeable area due to installation of ancillary infrastructure is available in Annex D of this technical note.

Compared to agricultural use, a solar farm is likely to be inherently better for surface water drainage than a continuation of the existing use. If a solar farm proposal avoids the creation of new hardstanding, includes mitigation for ancillary infrastructure, and will not alter existing landforms (e.g. levelling or bunds), a solar farm will not change existing characteristics and should be a positive improvement even with no additional SuDS measures.

The primary reason for this is the significant advantage from full year-round organically managed vegetated ground cover on a solar farm compared with intensive arable uses. Research undertaken by Cook and McCuen (2013) found that provided full vegetation cover beneath the solar panels is maintained, the change in runoff characteristics from solar farm sites is likely to be insignificant and that ground cover has a much more important control over runoff.

A solar farm already includes designed-in surface water flood risk mitigation. This is something solar PV planning applications do not always effectively communicate. It can be helpful to clarify some of the ways that surface water flood risk is addressed without adding-in new features.

The “requirement” for SuDS on development is set out in Paragraph 182 of the NPPF (2024) which states: *“182. Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:*

a) take account of advice from the lead local flood authority;

b) have appropriate proposed minimum operational standards; and

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.”

The requirement for SuDS is a “should”, not a “must”. It is our view that the lack of risk at the site, coupled with the temporary nature of the development, and a requirement for full reinstatement of the land, makes a case that SuDS beyond the minimum would be inappropriate.

The solar farm is a temporary development. Because the land will be returned to full agricultural use after the expiration of the temporary solar farm consent, SuDS that would require new intrusive or otherwise unnatural elements (e.g. pipework or tanks) or land shaping (e.g. swales) should only be required as a last resort to enable easy restoration to existing agricultural use with minimal ground disturbance or disruption to new and improved ecological features.

One of the multifunctional environmental benefits of a solar farm is soil quality improvement from cessation of intensive arable use and organic management of the land. It is expected that soil health will be improved through increase in soil organic matter, increase in the diversity of soil flora, fauna and microbes, and improved soil structure. All of the elements of a solar farm can be removed very easily with minimal topsoil disturbance which should leave the improved and enriched soil as a benefit for the return to agricultural use. Significant works to remove filter drains or level out swales that are not complimentary to a return to agriculture would undermine this benefit.

This could also lead to more problems elsewhere. Although a solar farm is a temporary consent that does not change the greenfield land classification, its 40-year lifetime is not short. Temporary land drainage measures that might unnaturally change the existing baseline could subsequently be relied on off-site as part of the wider ecosystem services network. When the solar farm is decommissioned and these are removed/reversed, there is a risk of adverse “downstream” impacts for those who have relied on the SuDS. Therefore, although SuDS are intended to contribute to flood risk resilience, the nature of a solar farm and its whole-life context needs to be carefully considered so that the sustainable development can be implemented in a sustainable manner and with an eye on the future restoration to existing conditions and the resumption of agricultural use.

The nature of the proposed development means that precipitation would be intercepted by between 25% to 40% of the surface of the site that is typically over-sailed by solar panels. A known concern is the risk of water “sheeting” off a solar array façade. As a result of the construction of the solar panels, some rainfall will be intercepted by the surface of the arrays before reaching ground level. Intercepted rainfall will either run down the face of the panels and drip onto the ground below or will be lost due to evaporation from the face of the panels. Without mitigation there is a risk of erosion of the ground on which rainwater drips. This could then result in the formation of rivulets which could increase the speed at which runoff discharges from the site.

However, the potential for erosion to occur as a result of the ‘drip effect’ is appropriately mitigated by features of the solar arrays themselves and appropriate seeded vegetation which will be provided below and between rows of the solar panels to act as a level spreader/energy dissipater to promote low erosivity sheet flow during operation of the solar farm. The vegetation will be managed organically and will either be mowed or used for light grazing. The grassland will not only grow between array gaps, it includes all ground under the arrays as well. This means that excluding the access tracks and ancillary infrastructure most of the site will be fully vegetated species rich pastoral grassland.

Without any additional development being required, the gaps between the arrays are natural filter strips (SuDS). The key takeaway is that the majority of the site has mitigation and SuDS inherently designed-in. The arrays are designed to avoid sheeting/pooling/erosion. Water drips off at multiple points onto vegetated ground below. In addition, there is significant space between rows (typically around 2-6m) to act as natural filter strips with vegetated ground that slows the movement of surface water.

In terms of inverters and ancillary infrastructure, due to the small size of the units, and the widespread nature of their locations across the development, it is impractical to connect them into a drainage scheme. The inclusion of the proposed gravel subbase is considered to be sufficient and it would have a betterment on existing soil porosity. Water runoff from these infrastructure will slowly drain into the underlying ground through infiltration.

During events exceeding the 1 in 100 + 40% climate change event, any resulting above-ground flooding would be temporary with shallow depths and would not affect the infrastructure on site or significantly increase flood risk to off-site locations, mimicking current site conditions.

The new infrastructure on a permeable gravel base will not change an underlying condition beyond the topsoil. What would otherwise be topsoil will be replaced by gravel, which has 30% more porosity and storage capacity than the existing topsoil would have. This means even if the gravel base is insufficient for storage and infiltration, the resulting conditions are no different than they would be on the as-is farmland, except that the extra storage capacity of the gravel base is a betterment compared to the topsoil in the event that underlying conditions are not supporting effective infiltration.

In terms of the substation compound, the sub-base depth will depend on the size of the building. In the calculations we have used the worst case scenario where the all substation compound will be impermeable and therefore would need a 550mm deep sub-base to attenuate the flows. In reality, the impermeable area associated to the substation will be much smaller than that therefore potentially reducing the sub-base depth to 300mm.

Additionally, due to the temporary nature of the development, it is considered impractical to route flows from the ancillary infrastructure through the field to the watercourse.

Cross Sections of SuDS structures

- Cross sections of the gravel sub-bases will be provided at detailed design stage. It is proposed that details such as cross sections are secured by condition at the detailed design stage, once planning permission has been granted. This approach allows for the refinement of the drainage design while ensuring sufficient storage on site.

Water Quality during Construction

- A construction environmental management plan and a construction surface water management plan will be prepared in conjunction with the appointed contractor. It will include evidence of adequate provision of surface water management, both in terms of runoff quantity (flow rates and volumes), as well as quality (pollution mitigation). It will include pollution prevention measures including responsibility, mitigation if required and monitoring & controls.
- It is therefore proposed that a construction surface water management plan is secured by a condition and carried out at the detailed design stage, once planning permission is granted.

Conclusion.

We trust that this information sufficiently addresses your information requirements for removing your objections to the proposed development of the planning application reference no. 3/24/2245/FUL, however should you require any further information or clarification then we would be happy to provide this.

Yours sincerely,
for RPS Consulting Services Ltd

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Annex A – LLFA Objections Letters

Growth & Environment

Hertfordshire

David Lamb
East Herts District Council
Wallfields
Pegs Lane
Hertford
Hertfordshire
HP1 1DN

Lead Local Flood Authority
Growth and Environment
Hertfordshire County Council
Post Point CHN 215
Farnham House
Six Hills Way, Stevenage
HERTFORDSHIRE, SG1 2ST
www.hertfordshire.gov.uk

Contact: Flood Risk Management Team
Email: FRMConsultations@hertfordshire.gov.uk

Date 18 February 2025

Dear David

RE: 3/24/2245/FUL – Installation and operation of a solar farm including co-located energy storage facilities, onsite substation, ancillary infrastructure and landscaping – Land to the West of the A507 Between Cottered and Cromer, Hertfordshire, SG9 9PU

Thank you for your re-consultation on the above site, received on 29 January 2025. We have reviewed the application as submitted and wish to make the following comments.

This is a Full Planning Application for a new solar farm including co-located energy storage facilities, onsite substation, ancillary infrastructure and landscaping.

We previously responded on the 9 January 2025 requesting the provision of the appendix and had several other objections to this proposal. Whilst the submission of the appendix has removed some of our previous objections, watercourse consent, infiltration testing, infiltration rate, simple index approach and resilience measures have not been updated in this revision. Therefore, the objections to these remain.

We **object** to this planning application in the absence of an acceptable Drainage Strategy relating to:

- The proposed SuDS are likely to increase the risk of flooding elsewhere.
- The development is not in accordance with NPPF, PPG or local policies.
    - Policy WAT1 – Flood Risk Management
    - Policy WAT3 – Water Quality and the Water Environment
    - Policy WAT5 – Sustainable Drainage

Reason
To prevent flooding in accordance with National Planning Policy Framework paragraphs 181, 182 and 187 by ensuring the satisfactory management of local flood risk, surface

water flow paths, storage and disposal of surface water from the site in a range of rainfall events and ensuring the SuDS proposed operates as designed for the lifetime of the development.

We will consider reviewing this objection if the issues highlighted on the accompanying Planning Application Technical Response document are adequately addressed.

Informative

For further advice on what we expect to be contained within the FRA and/ or a Drainage Strategy to support a planning application, please refer to the Validation List and Proforma on our surface water drainage webpage https://www.hertfordshire.gov.uk/services/recycling-waste-and-environment/water/surface-water-drainage/surface-water-drainage.aspx this link also includes HCC's Flood Risk Management policies on SuDS in Hertfordshire. We do expect the Validation List to be submitted to the Local Planning Authority and LLFA to show you have provided all information and the Proforma to the LLFA to summarise the details of the proposed development.

Erection of flow control structures or any culverting of an ordinary watercourse requires consent from the appropriate authority, which in this instance is Hertfordshire Lead Local Flood Authority and the Local Council (if they have specific land drainage bylaws). It is advised to discuss proposals for any works at an early stage of proposals.

Please note if, you the Local Planning Authority review the application and decide to grant planning permission, notify the us (the Lead Local Flood Authority), by email at FRMConsultations@hertfordshire.gov.uk.

Yours sincerely

Ellie

Ellie Miller
SuDS and Watercourses Support Officer
Growth and Environment

Annex

The following documents have been reviewed.

- Report: Flood Risk Assessment and Sustainable Drainage Strategy Appendix (A-I), prepared by RPS, October 2024, REF HILEF85532 REV 3
- Report: Flood Risk Assessment and Sustainable Drainage Strategy, prepared by RPS, October 2024, REF HILEF85532 REV 3
- Report: Flood Risk Sequential Test, prepared by RPS, November 2024, REF HILEF85532 REV 5

Planning Application Technical Response

Site:	Land To The West Of The A507 Between Cottered And Cromer, Hertfordshire, SG9 9PU
LPA Reference:	**3/24/2245/FUL**
Date Assessed:	09 January 2024

Hertfordshire

Supported by wsp

FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
All sources of flooding considered?	**NPPF Paragraph 170, 181** **PPG Paragraph 051** **SDNSTS S10** ***Policy WAT1 Flood Risk Management***	Provide updated information within an amended FRA on; ☐Fluvial flooding from the ordinary watercourse ☐Surface water flow path originating offsite ☐Groundwater flooding ☐Rainwater surcharged sewer flooding ☐Historic flood information	Fluvial – Flood Zone 2 Surface Water – Medium – follows the shape of the river Groundwater – Low Sewer – Low Historic – Not provided.
		☐ Address concerns that there is not sufficient room within the development boundary to address flood risk mitigation and also achieved the suggested density of the development.	Not required – Solar Farm.
Mitigation not appropriate	**NPPF Paragraph 170, 176, and 181** **PPG Paragraph 004, 023, 037, 041, 042, 043 and 044** ***Policy WAT1 Flood Risk Management***	☐Use sequential approach with the following hierarchy. I. how can the development first avoid the risk of flooding II. how will it be mitigated (with evidence) III. how will flood resistance and resilience be employed	Development is avoiding the risk of flooding. The river is remaining on site (no rerouting etc).
		☐ The proposal increases the risk of flooding to existing infrastructure, dwellings or property. Mitigation should be reassessed to show how flood risk can be reduced overall.	Not required – Solar Farm.
		☐ Provide information on safe access and egress to show how the development will be safe for its lifetime. This may include assessment of how proposals will not increase the number of people living and working in areas of flood risk and if there is any additional burden placed on the emergency services. An emergency plan may also form part of this assessment (see www.adeptnet.org.uk).	Not required – Solar Farm.

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FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
Long term sustainability of the development	**NPPF Paragraph 176 and 181** **PPG Paragraph 004, 036, 061, 068 and 069** ***Policy WAT1 Flood Risk Management***	☐ Provide site specific ordinary watercourse or surface water flow path hydrological and hydraulic modelling.	Not required – Surface Water modelling / Fluvial modelling has been undertaken.
		☒ Demonstrate that any residual risk is managed with appropriate flood resistance and resilience measures.	**Objection:** Residual risk needs to be further explored.
		☒Include evidence of appropriate freeboard to finished floor levels from the design flood level.	**Objection:** Floor levels are contained in Appendix F which has not been provided. We cannot provide comment until this has been provided.
		☐ Include appropriate climate change allowance on modelling scenarios for assessment of the lifetime of the development (including the 3.33% AEP design flood event).	Not required – Surface Water modelling / Fluvial modelling has been undertaken.
		☐Use up to date FEH2013 or 2022 rainfall data for all design flood events.	Not required – Surface Water modelling / Fluvial modelling has been undertaken.
		☒ Identification is required of those structures which require consent for works on an ordinary watercourse (from the LLFA), this extends to works required within 8m from the top of the bank (see HCC LLFA website).	**Objection:** Confirmation is required as to whether any works will be undertaken on the watercourse.
How does the site currently drain?	**NPPF Paragraph 182** **PPG Paragraph 059** **SDNSTS S1, S2, S3, S4, S5, S6** ***Policy WAT1 Flood Risk Management***	☒Evidence required on ground conditions / BRE365 or similar infiltration testing / dissolution potential / seasonally high groundwater levels.	**Objection:** Infiltration testing has not been provided for viability. This should be provided.
		☒ Greenfield runoff rates and volumes are missing or need to be recalculated (incorrect input parameters).	**Objection:** Volumes have not been provided.
		☐ Pre-development brownfield runoff rates are missing or need to be recalculated (incorrect input parameters).	Not required – Greenfield site.

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FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
		☐Drawing required to show where existing drainage network and outfall/s are, plus confirmation if will they be retained or removed.	Included – Field Drainage (informal).
		☐ Drainage survey required to provide evidence of existing discharge rate and condition (may include detailed asset or CCTV survey and estimation of discharge from an existing pipe diameter/slope).	Not required – Only informal field drainage.
Where will the site drain to?	**NPPF Paragraph 182** **PPG Paragraph 055, 056, 059, 060, 061, 062 and 063** **SDNSTS S12, 13 and S14** ***Policy WAT3 - Water Quality and the Water Environment***	Drainage location hierarchy has not been followed, further information is required on; ☐ Evidence why rainwater reuse can't be included.	Solar Farm – Not practical.
		☐ Source control and interception has not been provided by the provision of vegetated SuDS.	**Informative:** Further consideration to vegetated SuDS.
		☒ Infiltration proposals – re Groundwater Source Protection Zone I restrictions (only clean roof water in a sealed system may be discharged).	**Objection:** Infiltration testing has not been provided for viability. This should be provided.
		☒ Surface watercourse – does it connect to the wider network and is there permission and there are agreed access locations for proposed outfalls with the riparian owner?	**Objection:** There is no in-principle agreement for connection into the River Beane in the north.
		☐Surface water sewer – no in principle agreement from owner of the asset.	Not required – Not proposed.
		☐ Combined sewer – no in principle agreement from owner of the asset.	Not required – Not proposed.
		☐ In principle objection - proposing to connect surface water runoff to foul sewer.	Not required – Not proposed.

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		☐ Detailed justification required why the application cannot be drained via gravity and a pump is required.	Not required – No pumping.
		☐ Full impact assessment of failure of a pumped system and emergency procedures to store 24 hours of water is required.	Not required – No pumping.
		☐ Justification is required as to why a deep bore infiltration feature has been proposed prior to shallow infiltration or connection to a surface watercourse.	Not required – Deep bore has not been included.
Are the 4 pillars of SuDS provided and are they multifunctional?	**NPPF Paragraph 182** **PPG Paragraph 036, 055, 056, 059, 060, 061, 062 and 063** ***Policy WAT3 - Water Quality and the Water Environment***	☐ The application must provide water quantity benefits in open and above ground SuDS.	Included – Solar Farm – Open design features.
		☒ The application must provide water quality benefits. Appropriate water quality assessment is absent / incorrect.	**Objection:** Simple Index Approach has not been provided.
		☐ Additional water quality treatment using surface SuDS is required due to the sensitivity of the discharge location (including groundwater, designated surface watercourses or deep infiltration features).	Not required – Not a sensitive discharge location.
		☐ The application must provide biodiversity benefits or demonstrate why this is not achievable (lack of space will not be accepted).	Included – Solar Farm.
		☐ The application must provide amenity benefits or demonstrate why this is not achievable (lack of space will not be accepted).	Included – Biodiversity Enhancement (Section 5.1.2).
How will the site drain without adversely	**NPPF Paragraph 181, 182**	☒ The most precautionary infiltration rate should be used in the design of the attenuation feature.	**Objection:** The infiltration rate has been assumed as the 'best case scenario'. The worst-case scenario rate should be used.

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effecting flood risk elsewhere?	**SDNSTS S2, S3, S4, S5, S6** ***Policy WAT5 Sustainable Drainage***	☒ Infiltration rates are shown to be favourable and should be used in the drainage design (where appropriate).	**Objection:** The infiltration rate has been assumed as the 'best case scenario'. The worst-case scenario rate should be used.
		☒ Infiltration storage drainage design should be recalculated to either only discharge through the sides of the structure or apply the appropriate factor of safety.	**Objection:** The infiltration rate has been assumed as the 'best case scenario'. The worst-case scenario rate should be used.
		☒ Infiltration drainage storage has half drain down time greater than 24 hours and an alternative design or mitigation is required.	**Objection:** The infiltration rate has been assumed as the 'best case scenario'. The worst-case scenario rate should be used.
		☒The post development 100% AEP (or 1 in 1 year) rainfall event runoff rate should also be controlled to the equivalent pre-development rate.	**Objection:** Pre and Post development surface water runoff rates are in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☒ Proposed discharge rates and volumes are greater than greenfield with no justification.	**Objection:** Pre and Post development surface water runoff rates are in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☐ Proposed discharge rates include future allowances for climate change and / or urban creep. These must be removed, and all calculations resubmitted.	Not included – Urban Creep is not included.
		☐ Require justification and supporting calculations for brownfield % betterment and why this can't be closer to the predevelopment greenfield scenario.	Not required – Greenfield Site.
		☒ Proposed discharged rates would increase flood risk elsewhere and need to be re-assessed.	**Objection:** Pre and Post development surface water runoff rates are in Appendix I

FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
			which has not been provided. We cannot provide comment until this has been provided.
		☒ A minimum runoff rate between 1 to 2 l/s/ha should be applied in groundwater dominated areas if infiltration cannot be undertaken.	**Objection:** Pre and Post development surface water runoff rates are in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☒ How will the development not increase the volume of runoff as only pre and post calculations of greenfield runoff rate have been provided?	**Objection:** Pre and Post development surface water runoff rates are in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☒ A complex control for runoff rate with long term storage provided, is required, if the drainage proposal is not limiting runoff to QBAR or 2 l/s/ha.	**Objection:** Pre and Post development surface water runoff rates are in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☒ Include appropriate climate change allowance for the lifetime of the development (including 3.33% AEP design) for drainage modelling storage volumes.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ Drainage modelling calculations should be resubmitted and demonstrate how 10% urban creep has been included in the volume of SuDS storage required.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ Use up to date FEH2013 or FEH2022 rainfall parameters in any drainage modelling scenarios.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.

FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
Location of SuDS		☒ Layout and/or drainage layout drawings need to show all the drainage features (storage and conveyance), with labels the same as those in the submitted supporting calculations.	**Objection:** Confirmation of any formal drainage on site is required in a drawing. Currently, it is unclear as to whether formal drainage will be used on site.
		☐ Drawings need to show the detailed design (not preliminary issue).	**Informative:** Drainage drawings, when submitted will need to be detailed design.
		☒ Drawings of cross sections and long sections of all the network and structures such as ponds, basins and swales need to be supplied.	**Objection:** Confirmation of any formal drainage on site is required in a drawing. Currently, it is unclear as to whether formal drainage will be used on site.
What is the impact of flood risk on the development?	**NPPF Paragraph 182** **SDNSTS S7, S8, S9, S10 and S11** ***Policy WAT5 Sustainable Drainage***	Updated supporting calculations required to show;	
		☒ revised modelling calculations to use a CV value of 1.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ 50% AEP rainfall event does not surcharge in the drainage network if it is to be adopted by a responsible authority.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ 3.33% AEP rainfall event plus climate change does not flood outside the drainage network which is designed to hold water.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.

Site:	Land To The West Of The A507 Between Cottered And Cromer, Hertfordshire, SG9 9PU
LPA Reference:	**3/24/2245/FUL**
Date Assessed:	09 January 2024

FULL APPLICATION	Related Policy or Standard	Applicant Action Required	LLFA Specific Comment
		☒ 1% AEP rainfall event plus climate change does not leave the application boundary or flood any part of a building, utility plant susceptible to water (e.g. pumping station or substation) within the development boundary.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ the appropriate climate change allowance must be updated.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		Additional information is required showing; ☒ above ground flooding (extent, depth and velocity) at the 1% AEP rainfall event plus climate change must be provided on a drawing with proposed external ground levels and proposed finished floor levels of buildings.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ above ground flooding (extent and depth) at the 1% AEP rainfall event plus climate change should be designed to be held in the least vulnerable areas of the site e.g. open space.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		Flood resistance and resilience must be shown to be included in the design. ☒ A minimum of 300mm must be provided between any design flood event and the finished ground floor level. ☐ A minimum of 150mm above external ground levels and show that they are sloping away from vulnerable areas such as doorways.	**Objection:** Floor levels are contained in Appendix F which has not been provided. We cannot provide comment until this has been provided.

FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
		☒ Exceedance of the design 1% AEP rainfall event plus climate change (or failure of the drainage network) must be shown on a drawing, minimising impacts to people and property. This drawing will include proposed external ground levels, finished floor levels and any designed slopes on impermeable surfaces such as highways or car parks.	**Objection:** The Exceedance Flow Plan is in Appendix I which has not been provided. We cannot provide comment until this has been provided.
		☒ ½ drain down times need to be submitted and show that they are within 24 hours (or within 48 hours for features that are lined e.g. lined tanks or lined basins).	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ Any drainage network showing storage features with ½ drain down time greater than the 24 hours (or 48 hours for lined structures) must be redesigned to show how it can meet this standard or be increased in size to accommodate a subsequent storm event of 3.33% AEP flood event plus climate change allowance.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided.
		☒ The drainage calculations must be shown to include a surcharged outfall to a watercourse or culverted watercourse or watercourse within a sewer. This surcharge level must be the 1% AEP flood event of the receiving watercourse if known or bank full if not already hydraulically modelled.	**Objection:** Calculations are in Appendix H which has not been provided. We cannot provide comment until this has been provided. The development could discharge to a watercourse.
How will the drainage and watercourse features be managed and maintained?	**NPPF Paragraph 182** **PPG Paragraph 055, 057 and 058** **SDNSTS S10, S11, S12, S13 and S14**	☐ High level assessment of the maintenance of any SuDS features and structures and who will be adopting these features for the lifetime of the development.	Included – Section 10.5.

Planning Application Technical Response

Site:	Land To The West Of The A507 Between Cottered And Cromer, Hertfordshire, SG9 9PU
LPA Reference:	**3/24/2245/FUL**
Date Assessed:	09 January 2024

Hertfordshire

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FULL APPLICATION	Related Policy or Standard	Applicant Action Required	LLFA Specific Comment
		☐ Appropriate easements (to the adopting authority standard) to SuDS features should be shown on a drawing, this will be a minimum of 3m.	Not required – No SuDS requiring easement.
		☐ Vehicular access route and off-road parking needs to be provided to ponds, basins and swales.	Not required – No SuDS requiring vehicular access
		☐ Provide an easement of a minimum of 3 m from the top bank of any watercourse is required for maintenance. This should be on both banks, but justification should be provided if access is proposed from only one side of the bank or is less than 3m (e.g. 2.5 times the width of any plant likely to be used (from the top of bank with maintenance plant parallel to the watercourse).	Not required – Watercourse not within the RLB.
		☐ Due to the likely long duration build out time (including phased development proposals), supporting drainage calculations and drawings are required to show a timeline of how temporary measures will be put in place to protect the water environment and any newly built SuDS features. This will include any temporary water quality and water quantity flow control devices required.	Not required – Not a phased development.
		☐ As it is a phased development, a surface water management and construction phasing plan is required. This must show how each phase can be provided independently (in terms of surface water drainage) and how any infrastructure which is relies on will be constructed prior to any housing or commercial development.	Not required – Not a phased development.

Planning Application Technical Response

Site:	Land To The West Of The A507 Between Cottered And Cromer, Hertfordshire, SG9 9PU
LPA Reference:	**3/24/2245/FUL**
Date Assessed:	09 January 2024

Hertfordshire

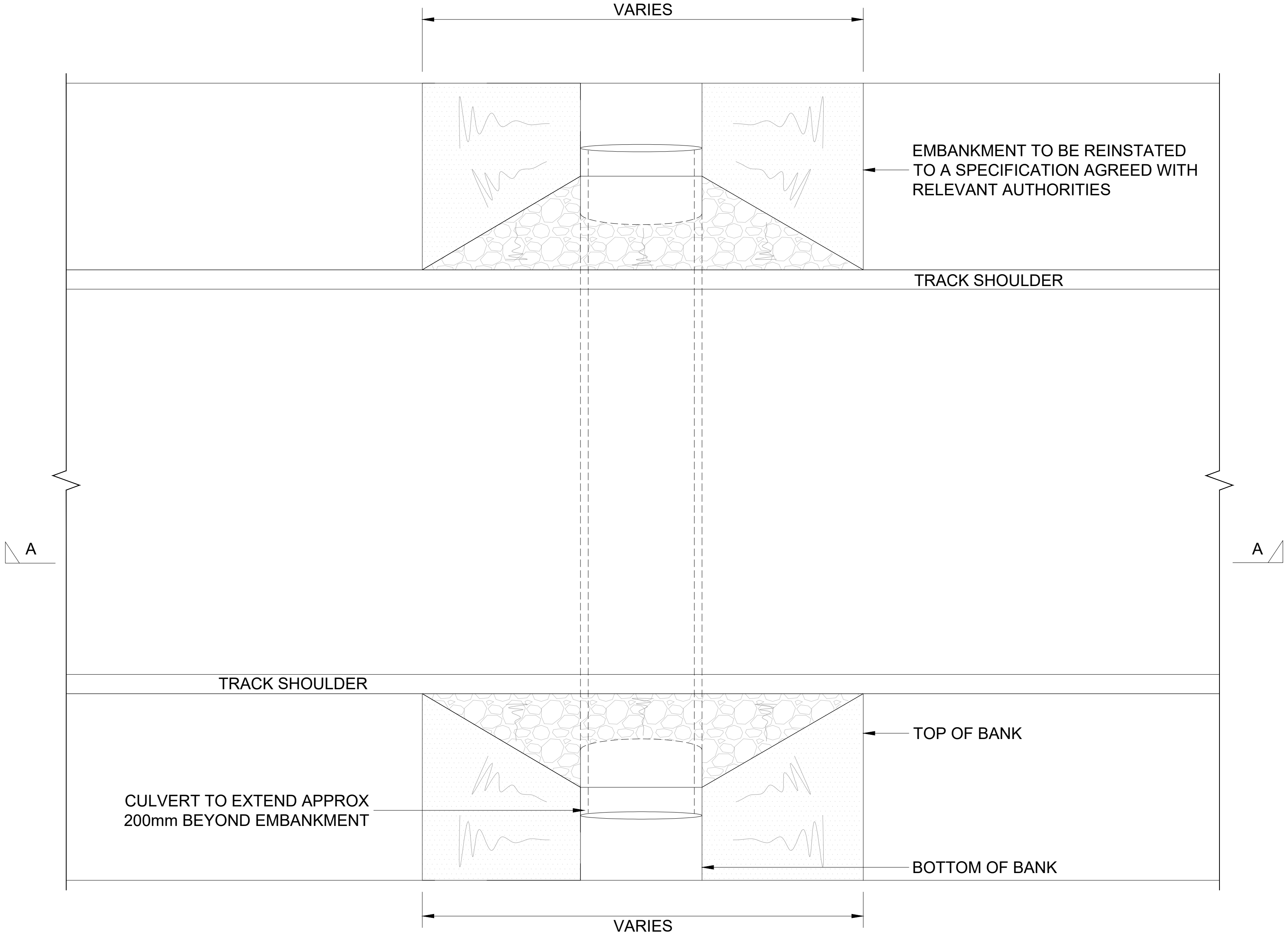
Supported by wsp

FULL APPLICATION	**Related Policy or Standard**	**Applicant Action Required**	**LLFA Specific Comment**
		☒ A high-level assessment of how water quantity and water quality will be managed during the construction phase is required. Identifying high level assumptions such as need to discharge to a sewer or watercourse with appropriate pollution measures.	**Objection:** A high-level assessment of water quality during construction is required.
Other		☐ Bespoke advice	Not required – Covered in checklist.

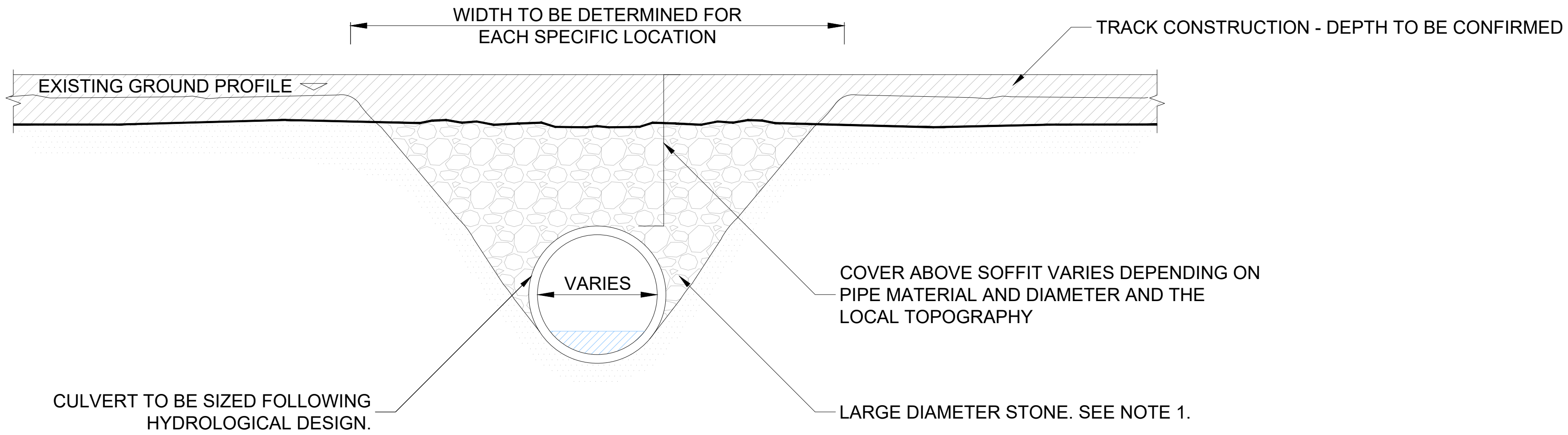
Annex B – Culvert Upgrade on Ordinary Watercourse

NOTES:

1. FINAL SPECIFICATION AND INSTALLATION METHOD TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES.
2. CULVERT TYPE AND SIZING TO BE DEFINED DURING DESIGN OF ON-SITE DRAINAGE SYSTEMS.



PLAN



SECTION A-A

Produced by: Francesco Ghergo

Renewable Energy Systems Ltd
Registered Office: Beaufort Court, Egg Farm Lane, Kings Langley, Hertfordshire WD4 8LR

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
1	FG	AP	RB	2025-01-17	First Issue

PURPOSE: PERMITTING	COORDINATES: N/A
SCALE: 1:75 @A3	DATUM: N/A
LAYOUT DRAWING: N/A	T-LAYOUT NO: N/A

PROJECT TITLE
CUILMORE EXTENSION

DRAWING TITLE
FIGURE 12
INDICATIVE CULVERT
WATERCOURSE CROSSING

RES DRAWING NUMBER	REV
05415-RES-DRN-DR-PT-001	1

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Annex C – Causeway Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	9.000
CV	1.000	Preferred Cover Depth (m)	1.000
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1		5.00	100.000	1200	1010.000	1000.000	1.400
2-SOAKAWAY	0.007	5.00	100.000	1200	1020.000	1000.000	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	2880	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	0	0

Node 2-SOAKAWAY Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00001	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00001	Porosity	1.00	Time to half empty (mins)	7313304

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	565.0	565.0	1.500	1169.0	1169.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	98.600	0.000	0.0	0.0000	0.0000	OK
960 minute winter	2-SOAKAWAY	915	98.514	0.014	0.3	7.9089	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	1	1.001	2-SOAKAWAY	0.0	0.000	0.000	0.0008
960 minute winter	2-SOAKAWAY	Infiltration		0.0			

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	9.000
CV	1.000	Preferred Cover Depth (m)	1.000
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1		5.00	100.000	1200	1010.000	1000.000	1.400
2-SOAKAWAY	0.003	5.00	100.000	1200	1020.000	1000.000	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	2880	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	0	0

Node 2-SOAKAWAY Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00001	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00001	Porosity	1.00	Time to half empty (mins)	7313304

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	565.0	565.0	1.500	1169.0	1169.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	98.600	0.000	0.0	0.0000	0.0000	OK
360 minute winter	2-SOAKAWAY	344	98.505	0.005	0.3	2.9263	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	1	1.001	2-SOAKAWAY	0.0	0.000	0.000	0.0003
360 minute winter	2-SOAKAWAY	Infiltration		0.0			

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	9.000
CV	1.000	Preferred Cover Depth (m)	1.000
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1		5.00	100.000	1200	1010.000	1000.000	1.400
2-SOAKAWAY	0.276	5.00	100.000	1200	1020.000	1000.000	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m^3/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	2880	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	0	0

Node 2-SOAKAWAY Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00001	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00001	Porosity	1.00	Time to half empty (mins)	7313304

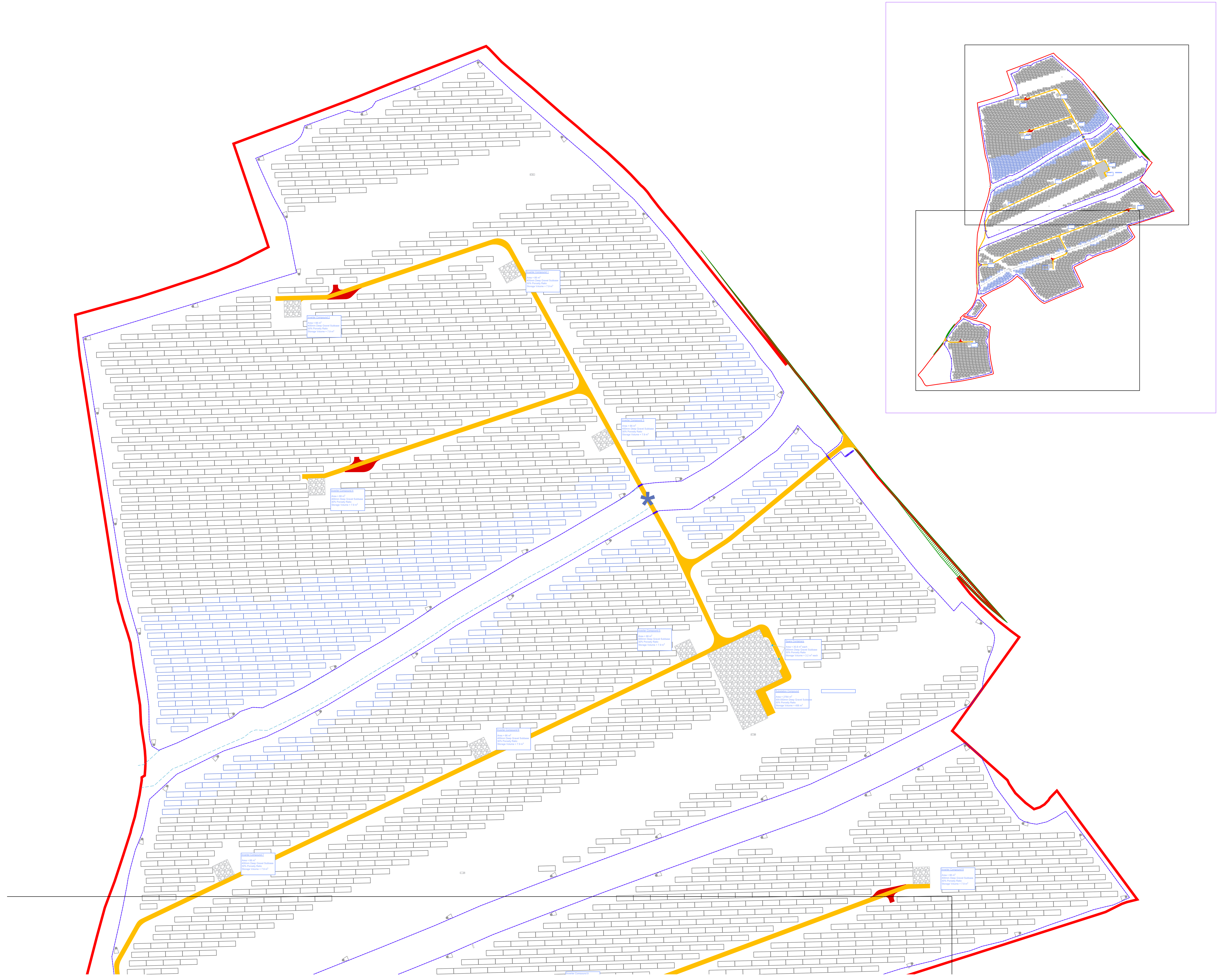
Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	565.0	565.0	1.500	1169.0	1169.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute summer	1	10140	99.128	0.528	0.0	0.5973	0.0000	SURCHARGED
10080 minute summer	2-SOAKAWAY	10140	99.128	0.628	2.8	435.0031	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
10080 minute summer	1	1.001	2-SOAKAWAY	0.0	0.000	0.000	0.3977
10080 minute summer	2-SOAKAWAY	Infiltration		0.0			

Annex D – Drainage Layout



Notes

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N

KEY

- Gravel Sub Base
- Indicative Solar PV Array
- Site Boundary

Rev	Description	By	Ckd	Date
1	Conceptual Drainage Strategy	TH	FC	10:04:25

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Client: Elgin Energy

Project: Cottered Solar Farm

Title: Conceptual Drainage Strategy Sheet 1

Status	Scale	Date Created
DRAFT	1:1 @A1	10.04.25

Task Team Manager	Information Author	Task Information Manager
FC	FC	

Document Number: HLEF85532-RPS-P-CDS-DR-1-100425

RPS Project Number: HLEF 85532

Revision: 1

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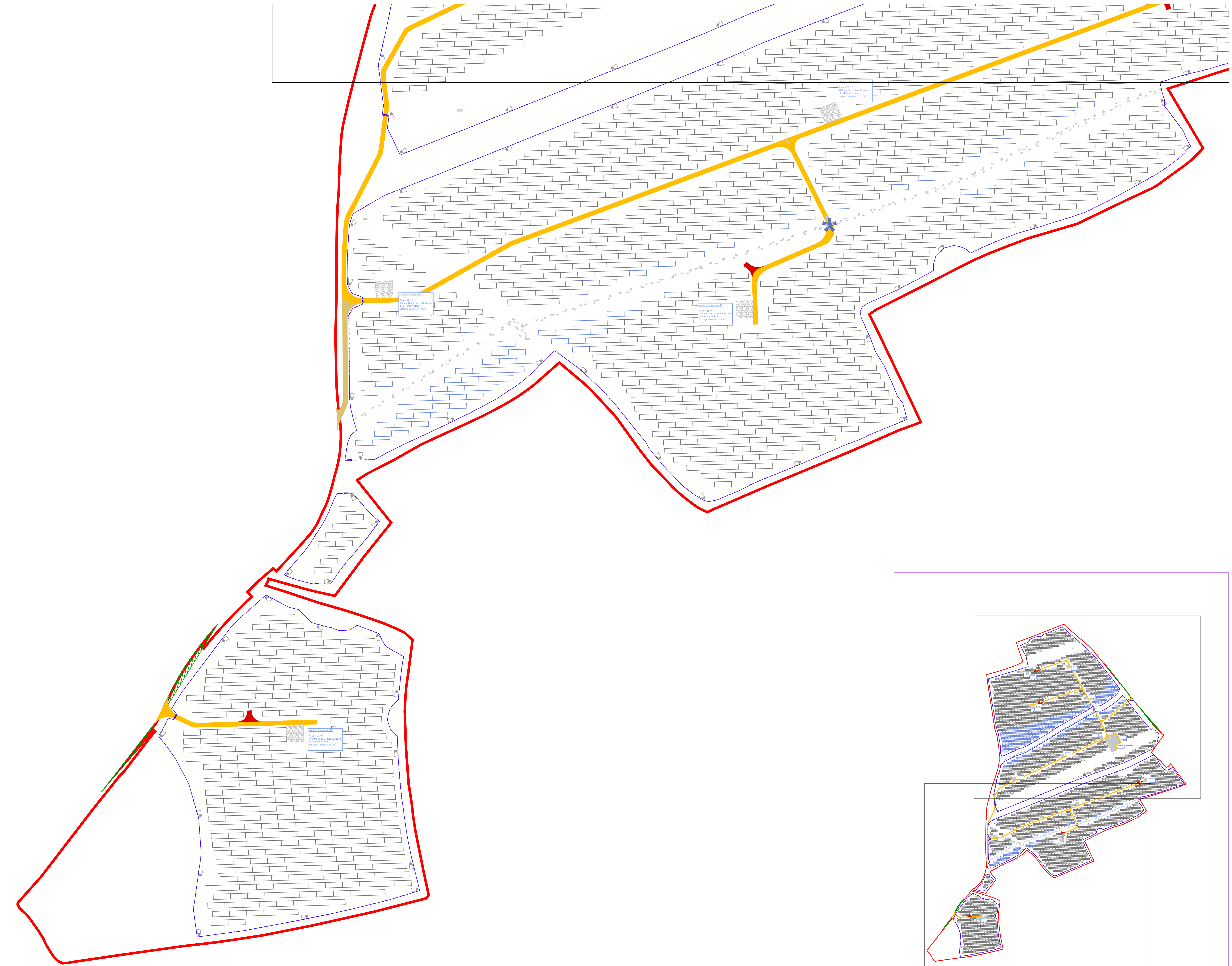

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N

KEY

Gravel Sub Base

Indicative Solar PV Array

Site Boundary

Rev	Description	By	Ckd	Date
1	Conceptual Drainage Strategy	TH		

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Client: Elgin Energy

Project: Cottered Solar Farm

Title: Conceptual Drainage Strategy Sheet 1

Status: DRAFT

Scale: 1:1 @A1

Date Created: 10.04.25

Task Team Manager: FC

Information Author: FC

Task Information Manager:

Document Number: HLEF85532-RPS-P-CDS-DR-1-100425

RPS Project Number: HLEF 85532

Revision: 1

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