CC018

	Chelmsford City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables
Site details	
Site Code	**SGS17d**
Address	Land South and South East of East Hanningfield Village
Area	7.9ha
Current land use	Greenfield
Proposed land use	Residential
Flood Risk Vulnerability	More Vulnerable
Sources of flood risk	
Location of the site within the catchment	The site is located south of the village of East Hanningfield, approximately 5km south east of Chelmsford, and is currently an agricultural field. The site is bordered by residential dwellings to the north, agricultural fields and watercourses to the south and Old Church Road to the north-west. The site is located within the Sandon Brook (East arm) catchment, which has an area of 30.8km^2 and is within the Chelmer Operational Catchment of the Combined Essex Management Catchment. The Sandon Brook (East arm) has not been designated as an artificial or heavily modified catchment.
Topography	The Environment Agency 1m resolution LiDAR shows that the topography of the site falls from the north towards the watercourses along the southern boundary. The highest elevation along the northern boundary of the site at 55.1mAOD. The lowest LiDAR shows the lowest elevation of the site is at the southern corner at a level of 50.6mAOD.
Existing drainage features	There is an unnamed ordinary watercourse which enters the site at the eastern corner of the site. The watercourse flows in a south west direction along the boundary of the site before changing direction and flowing south along the western boundary of the south-east field, before leaving the site. As the watercourse changes direction, is it met by another ordinary watercourse flowing along the southern boundary. Mapping also shows a field drain along the eastern boundary of the site.
Critical Drainage Area	The site is not located within a Critical Drainage Area.
Fluvial and tidal	**The proportion of site at risk FMFP:** **FZ3 – 0%** **FZ2 – 0%** **FZ1 – 100%** **Available data:** The proportion of the site at flood risk is determined from the Environment Agency's Flood Map for Planning Flood Zones. This represents the undefended scenario. **Flood characteristics:** The Flood Map for Planning shows that this site is not at risk from fluvial flooding associated with Main Rivers or the tide.

	Flood risk associated with the ordinary watercourses that flows along the boundary of the site will be modelled as surface water and therefore is discussed in the section below.
Surface Water	**Proportion of site at risk (RoFSW):** **3.3% AEP** – 9% Max depth – 0.3m Max velocity – 0.50m/s **1% AEP** – 17% Max depth – 0.6m Max velocity – 0.50/s **0.1% AEP** – 21% Max depth – 0.6m Max velocity – 1.00m/s *The % Surface Water extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 100-year includes the 30-year %).* The Environment Agency's Risk of Flooding from Surface Water (2025) mapping was used in this assessment of surface water flooding. **Description of surface water flow paths**: During the 3.3% AEP surface water event, there is a surface water flow path along the southeast boundary of the site which follows the route of the watercourse. The mapping shows that the anticipated depths are up to 0.3m with a velocity of 0.50m/s, which equates to a hazard rating of 'Moderate – dangerous for some'. Within the channel, water levels are anticipated to be 0.3m. There is also a surface water flow route along the western boundary of the site, with depths of up to 0.2m, a maximum velocity of 0.5m/s and a hazard rating of 'Moderate – dangerous for some' in the south western corner. The extent of the surface water flooding increases across the site during the 1% AEP event. The depth of the flow path along the southeast boundary is shown to be approximately 0.6m, whilst the velocity remains the same as the 3.3% AEP event, the hazard rating increases to 'Significant ' Dangerous for most people' along the corridor of the watercourse. During the 1% AEP event, the depth of the flow path along the western boundary increases to 0.3m, which causes an increase in the hazard rating to 'Significant – Dangerous for most people'. The mapping also shows additional shallow flow routes (less than 0.2m in depth) along the northern boundary. During the 0.1% AEP event, the extent of surface water flooding extends to 21% of the site, with an additional flow path in the northeast section of the site. Anticipated depths of the surface water flooding is 0.6m with an increased in velocity to and the velocity increases to 1.00m/s. The hazard is 'Significant – Dangerous for most people'.
Reservoir	The Environment Agency's (EA) risk of flooding from reservoirs dataset shows that the site is not at risk from reservoir flooding in the wet or dry day scenario.
Groundwater	JBAs Groundwater Emergence Map, is provided as 5m resolution grid squares. The site is shown to have negligible risk of groundwater emerging in this area, and any groundwater emergence incidence has a chance of less than 1% annual probability of occurrence. There will be a remote possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location. The risk from groundwater should be confirmed and quantified as part of a site-specific flood risk assessment (FRA).

Sewers	Sewer flooding records were not available for this assessment. The entirety of Chelmsford is identified as a Flood priority catchment in Anglian Water's Drainage and Wastewater Management Plan (DWMP). Developers should consult Anglian Water as part of any development proposal to ensure development does not exacerbate existing issues and maximise opportunities for development to deliver benefits in line with the long term strategic aims set out in their Drainage and Wastewater Management Plan.
Flood history	The Environment Agency's Historic Flood Map does not show any records of flooding on the site. Essex County Council as Lead Local Flood Authority (LLFA) has no records of flooding within the site boundary. There is a record of flooding approximately 250m north-west of the site along Back Lane.
Flood risk management infrastructure	
Defences	The Environment Agency AIMS dataset shows there are no formal flood defences in the vicinity of the site.
Residual risk	There are no defences or assets which could pose a residual risk to the site in the event of a breach or failure.
Emergency planning	
Flood warning	The site is not located in an Environment Agency Flood Alert or Flood Warning Area.
Access and egress	The access and egress will be via Old Church Road, north-west of the site. There is a flow path along the boundary with Old Church Road, the hazard ratings for each AEP are as follows: 3.3% AEP: Low - Caution 1% AEP: Low - Caution 0.1% AEP: Moderate – Dangerous for some people The site is currently undeveloped and surface water flows are likely to be affected by the form of any built development and associated drainage features. A site-specific FRA should consider the risk from surface water considering land levels and drainage features associated with the post development scenario, rather than just the currently available results. Arrangements for safe access and egress will need to be demonstrated for 1% AEP plus an appropriate allowance for climate change, using the depth, velocity, and hazard outputs.
Dry Islands	The flood risk mapping suggests that the site will not become a dry island during a flood event.
Climate change	
Implications for the site	**Management Catchment: Combined Essex Management Catchment** Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard, and frequency of both fluvial and surface water flooding. **Fluvial** The Environment Agency Flood Map for Planning now has climate change allowances incorporated into the data.

	The mapping shows that the site is not within Flood zone 2 or 3 in a climate change scenario. **Surface Water:** Climate change allowances, up to 2060, have been applied to the NaFRA2 dataset for surface water flooding using the UK Climate Projections (UKCP18). Across the site, the extent of the 3.3% AEP event plus climate change has a greater extent than the present day 3.3% AEP event, but not as great as the 1% AEP event. The extent of the 1% plus climate change event shows an increase across the site compared to the present day 1% AEP event. During the 0.1% AEP event plus climate change, the extent of the surface water flooding across the site is significantly greater than the 0.1% AEP present day event. Based on the information presented, it can be inferred that this site is sensitive to surface water climate change. Development proposals at the site must address the potential changes associated with climate change and be designed to be safe for the intended lifetime. The provisions for safe access and egress must also address the potential increase in severity and frequency of flooding.
Requirements for drainage control and impact mitigation	

Broad-scale assessment of possible SuDS	**Geology & Soils**
	
	• Geology at the site consists of:
	  ○ Bedrock Geology –
	  North section of site: Claygate Member consisting of clay, silt and sand.
	  South section of site: London Clay Formation consisting of clay, silt and sand.
	  ○ Superficial Geology –
	  Lowestoft formation consisting of Diamicton
	  Head consisting of clay, silt, sand and gravel.
	• Soils at the site consist of:
	  ○ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
	
	SuDS
	
	• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work.
	• British Geological Survey data indicates that the underlying geology is a mixture of clay, silt, and sand which is likely to be with highly variable permeability. This should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site.
	• The site is not located within a Groundwater Source Protection Zone.
	• The site is located within a Nitrate Vulnerable Zones (2017):
	  ○ River Chelmer (surface water)
	• The site is located within a Drinking Water Safeguard Zone.
	• The site is not located within a historic landfill site.
	• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques.
	• The Risk of Flooding from Surface Water (RoFSW) mapping indicates the presence of surface water flow paths during the 3.3% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.

	• If it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner.
Opportunities for wider sustainability benefits and integrated flood risk management	• Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity, and biodiversity. This could provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (Local Planning Authority, LLFA and EA) at an early stage to understand possible constraints. • Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces, and rainwater harvesting must be considered in the design of the site. • SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and they should be supported by an appropriately detailed maintenance and operation manual. • Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and the Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will clean and improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered. Conveyance features should be located on common land or public open space to facilitate ease of access. Where slopes are >5%, features should follow contours or utilise check dams to slow flows.
NPPF and planning implications	
Exception Test requirements	The site is classified as 'More Vulnerable' and is at high risk from surface water flooding. The Exception Test is not required under the NPPF; however the Sequential Test must be passed, unless a site-specific FRA demonstrates that the site can be developed safely without increasing flood risk elsewhere. It must be shown that the development will be safe for its lifetime and the risk of flooding from all sources can be managed through a sequential approach to design.

Requirements and guidance for site-specific Flood Risk Assessment	**Flood Risk Assessment:**
	• At the planning application stage, a site-specific FRA will be required as the proposed development site is:
	  ○ Greater than one hectare
	  ○ At risk of surface water flooding)
	• All sources of flooding should be considered as part of a site-specific FRA.
	• Consultation with Chelmsford City Council, Essex County Council, Anglian Water, and the Environment Agency should be undertaken at an early stage.
	• Any FRA should be carried out in line with the National Planning Policy Framework (NPPF); Flood Risk and Coastal Change Planning Practice Guidance (PPG); and the Council's Local Plan's SuDS Policy.
	• Assessment of surface water risk to the site should be supported by detailed modelling, and consider the post-development site-layout and drainage features as well as the present undeveloped risk.

	Guidance for site design and making development safe: • The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG). • The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are limited to pre-development greenfield rates. • Arrangements for safe access and egress will need to be provided for the 1% AEP fluvial and rainfall events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate measures, so development and occupants are safe. See Section 8.6 of the Level 1 Strategic Flood Risk Assessment (SFRA) for details of the requirements for plans. • Provisions for safe access and egress should not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk. • Flood resilience and resistance measures should be implemented where appropriate during the construction phase, e.g. raising of floor levels and use of boundary walls. These measures should be assessed to make sure that flooding is not increased elsewhere.

Key messages

The site is in Flood Zone 1 but is at high risk of surface water flooding. With regards to managing the flood risk, development may be able to proceed if:

- Safe access and egress can be demonstrated in the surface water 1% AEP plus climate change events. This includes measures to reduce flood risk along these routes such as raising access, but not displacing floodwater elsewhere. Given the significant risks to the site, a suitable flood warning and evacuation plan will be required if development is located within areas of risk and/or safe access and egress cannot be provided in an extreme event.
- Existing drainage features on the site are incorporated into a sustainable drainage design for the site and considered within the wider development design.
- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, with development steered away from the areas identified to be at risk of surface water flooding across the site.
- A site-specific FRA demonstrates that site users will be safe throughout the lifetime of the development and that development of the site does not increase the risk of surface water/fluvial flooding on the site and downstream.

Mapping Information

The key datasets used to make planning recommendations for this site were the Environment Agency's Flood Map for Planning and the Environment Agency's Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

Flood Zones	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning mapping.
Climate change	Climate change allowances have been incorporated into the Environment Agency's Flood Map for Planning.

	Climate change allowances have been incorporated into the Environment Agency's Risk of Flooding from Surface Water mapping.
Fluvial and tidal extents, depth, velocity and hazard mapping	N/A – not required for this assessment.
Surface Water	The Risk of Flooding from Surface Water map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	Environment Agency's Risk of Flooding from Surface Water dataset.