East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets
Area	5.0 hectares
Current land use	Axminster Carpets
Proposed land use	Mixed use/Commercial
Flood Risk Vulnerability	More vulnerable
Sources of flood risk	
Location of site	The site is located to the south of the centre of Axminster, at the end of Woodmead Road and west of the A358. The site is located 80m east of the River Axe, and a small tributary passes underneath the site through a culvert.
Topography	The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography of the site declines from the east (41mAOD) to the west (24.7mAOD). The topography is shown to fall most rapidly far east within the first 50m before declining with a relatively continuous gradient along the remainder of the site. The gradient is approximately 4%, therefore the site is considered to have a gentle slope, and is unlikely to affect any proposed SuDS features. The catchment therefore drains west into the River Axe.
Existing drainage features	The site is shown to contain a culvert that passes underneath the site as a tributary of the River Axe. The existing surface water drainage system on site is unknown and should be investigated prior to development.
Fluvial	**Available data and mapping:** Environment Agency Flood Map for Planning for Rivers and Sea and the Axminster Carpets Flood Modelling. The Axminster Carpets Flood Modelling was developed by JBA Consulting in 2024 for this Level 2 SFRA assessment for East Devon District Council. Axmi_07 - Fluvial 3.3% AEP – Depth Axmi_07 - Fluvial 3.3% AEP – Hazard Axmi_07 - Fluvial 3.3%AEP - Velocity Axmi_07 - Fluvial 1% AEP – Depth Axmi_07 - Fluvial 1% AEP – Hazard Axmi_07 - Fluvial 1% AEP - Velocity Axmi_07 - Fluvial 0.1% AEP – Depth Axmi_07 - Fluvial 0.1% AEP – Hazard Axmi_07 - Fluvial 0.1% AEP - Velocity **Data analysis:** Details of the sites location within each Flood Zone are provided within the SFRA Site Screening Appendix. Details are provided below for the Axminster flood modelling: **3.3% AEP (1 in 30 year) event:** Proportion - 26% Max Depth – 1.67m Mean Depth – 0.07m Max Velocity – 1.36m/s Mean Velocity – 0.08m/s Max Hazard – 3.65 Mean Hazard – 0.55

East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets
	1% AEP (1 in 100 year) event: Proportion - 30% Max Depth – 1.74m Max Velocity – 2.41m/s Max Hazard – 3.7 Mean Depth – 0.13m Mean Velocity – 0.13m/s Mean Hazard – 0.63 **0.1% AEP (1 in 1000 year) event:** Proportion - 32% Max Depth – 1.84m Max Velocity – 3.67m/s Max Hazard – 4.39 Mean Depth – 0.22m Mean Velocity – 0.2m/s Mean Hazard – 0.84 **Flood characteristics:** <u>Flood Map for Planning</u> The site is partially located within Flood Zone 2 and 3 to the west/south and east of the site, due to a watercourse crossing from east to west. The remainder of the site in the north is located within Flood Zone 1. • Flood Zone 1 represents areas which have less than 1 in 1000 (0.1%) chance of river flooding in a given year. • Flood Zone 2 represents areas which have less than 1 in 100 (1%) but greater than 1 in 1000 (0.1%) chance of river flooding in a given year. • Flood Zone 3 representing an area greater than 1 in 100 (1%) chance of river flooding in a given year. <u>Axminster Carpets Flood Risk Modelling</u> The site is shown to flood across the south and western portions of the site in all three events, with an increasing southern extent through AEP events. Flood coverage increases from 26% within the 3.3% AEP event, to 30% within the 1% AEP and 32% within the 0.1% AEP event. The mean depth and hazard on site during the 0.1% AEP event is shown to be 0.22m and 0.84 rated as a 'danger to some'. The average velocity on site is shown to be 0.2m/s, with a maximum of 3.67m/s. The modelling shows a decrease in flooding within the eastern portion of the site in comparison to the Flood Map for Planning. Within the model flood event it is evident that during the 1% AEP event the onset of flooding is relatively rapid with the maximum flood depth seen at 4 hours, with the site flooding first flooding at 2.5 hours. The majority of flooding on site is then shown to have subsided by 8 hours.
Fluvial plus climate change	**Available data and mapping:** The Axminster Carpets Flood Risk modelling developed by JBA Consulting in 2024 for this Level 2 SFRA assessment for East Devon District Council, was also run to include the 46% and 61% climate change allowances. Axmi_07 - Fluvial 3.3% AEP plus 46% Climate Change – Depth Axmi_07 - Fluvial 3.3% AEP plus 46% Climate Change – Hazard Axmi_07 - Fluvial 3.3%AEP plus 46% Climate Change - Velocity Axmi_07 - Fluvial 1% AEP plus 46% Climate Change – Depth Axmi_07 - Fluvial 1% AEP plus 46% Climate Change – Hazard Axmi_07 - Fluvial 1% AEP plus 46% Climate Change - Velocity Axmi_07 - Fluvial 0.1% AEP plus 46% Climate Change – Depth Axmi_07 - Fluvial 0.1% AEP plus 46% Climate Change – Hazard

East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets

Axmi_07 - Fluvial 0.1% AEP plus 46% Climate Change - Velocity

Management Catchment: Axmi_07 is located within the East Devon Management Catchment. The Environment Agency guidance recommends that the central allowance is assessed for sites within Flood Zones 2 and 3a for sites that have a flood risk vulnerability of 'More Vulnerable'. The recommended uplift on peak river flow allowances for the central and higher central estimate for the 2080s are 46% and 61% respectively. The model was therefore set to run with a 46% and 61% climate change allowance to reflect these allowances and the results are discussed below for completeness, however mapping has only been provided for the 46% central allowance as recommended.

Data analysis:

3.3% AEP (1 in 30 year) plus 46% Climate Change event:

Proportion - 31%

Max Depth – 1.76m	Mean Depth – 0.15m
Max Velocity – 2.78m/s	Mean Velocity – 0.15m/s
Max Hazard – 3.74	Mean Hazard – 0.66

3.3% AEP (1 in 30 year) plus 61% Climate Change event:

Proportion - 31%

Max Depth – 1.78m	Mean Depth – 0.17m
Max Velocity – 3.12m/s	Mean Velocity – 0.16m/s
Max Hazard – 3.82	Mean Hazard – 0.7

1% AEP (1 in 100 year) plus 46% Climate Change event:

Proportion - 32%

Max Depth – 1.83m	Mean Depth – 0.2m
Max Velocity – 3.54m/s	Mean Velocity – 0.19m/s
Max Hazard – 4.27	Mean Hazard – 0.8

1% AEP (1 in 100 year) plus 61% Climate Change event:

Proportion - 32%

Max Depth – 1.85m	Mean Depth – 0.22m
Max Velocity – 3.71m/s	Mean Velocity – 0.2m/s
Max Hazard – 4.59	Mean Hazard – 0.85

0.1% AEP (1 in 1000 year) plus 46% Climate Change event:

Proportion - 34%

Max Depth – 1.93m	Mean Depth – 0.29m
Max Velocity – 4.37m/s	Mean Velocity – 0.25m/s
Max Hazard – 5.57	Mean Hazard – 1.04

0.1% AEP (1 in 1000 year) plus 61% Climate Change event:

Proportion - 35%

Max Depth – 1.95m	Mean Depth – 0.3m
Max Velocity – 4.54m/s	Mean Velocity – 0.26m/s
Max Hazard – 5.94	Mean Hazard – 1.07

East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets
	Flood characteristics: The site is shown to flood in all six events along the west and southern portions of the site. The maximum extent of flooding is within the 0.1% AEP plus 61% climate change covering 35% of the site, with an average depth of 0.3m. The mean velocity during this event is 0.26m/s, with a maximum of 4.54m/s. The average hazard on site is shown to be 1.07, which is stated to be a 'danger to some'. It should be noted the even during the 0.1% AEP plus 61% climate change event there is a significant decrease in the flood extent in comparison to the Flood Map for Planning Flood Zones across the eastern half of the site.
Fluvial Blockage Scenario	**Available data and mapping:** The Axminster Carpets Flood Risk modelling developed by JBA Consulting in 2024 for this Level 2 SFRA assessment for East Devon, was also run to include a blockage scenario along the culvert underneath the site for the 1% AEP and 1% plus 46% and 61% climate change allowances. Axmi_07 - Fluvial 1% AEP plus 75% Blockage – Depth Axmi_07 - Fluvial 1% AEP plus 75% Blockage – Hazard Axmi_07 - Fluvial 1% AEP plus 75% Blockage - Velocity Axmi_07 - Fluvial 1% AEP plus 46% Climate Change with 75% blockage - Depth Axmi_07 - Fluvial 1% AEP plus 46% Climate Change with 75% blockage - Hazard Axmi_07 - Fluvial 1% AEP plus 46% Climate Change with 75% blockage - Velocity **Data analysis:** **1% AEP (1 in 100 year) with 75% blockage event:** Proportion - 32% Max Depth – 1.82m — Mean Depth – 0.2m Max Velocity – 3.45m/s — Mean Velocity – 0.18m/s Max Hazard – 3.46 — Mean Hazard – 0.77 **1% AEP (1 in 100 year) plus 46% Climate Change with 75% blockage event:** Proportion - 33% Max Depth – 1.89m — Mean Depth – 0.25m Max Velocity – 3.98m/s — Mean Velocity – 0.22m/s Max Hazard – 4.27 — Mean Hazard – 0.95 **1% AEP (1 in 100 year) plus 61% Climate Change with 75% blockage event:** Proportion - 33% Max Depth – 1.9m — Mean Depth – 0.26m Max Velocity – 4.1m/s — Mean Velocity – 0.23m/s Max Hazard – 4.47 — Mean Hazard – 0.98 **Flood characteristics:** The 75% blockage scenario is shown to increase the extent of flooding to the site across the three modelled events. The 0.1% AEP plus 61% climate change event has shown a 1% increase in site coverage, with an average depth of 0.26m. The mean velocity is shown to be 0.23m/s, with a maximum of 4.1m/s. The average hazard rating is 0.98, classed as a 'danger to some'.

East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets
Surface Water	**Available data and mapping:** Environment Agency's Risk of Flooding from Surface Water dataset for the 3.33%, 1% and 0.1% AEP events. Axmi_07 - Surface Water 3.33% AEP – Depth Axmi_07 - Surface Water 3.33% AEP – Hazard Axmi_07 - Surface Water 3.33% AEP - Velocity Axmi_07 - Surface Water 1% AEP – Depth Axmi_07 - Surface Water 1% AEP – Hazard Axmi_07 - Surface Water 1% AEP - Velocity Axmi_07 - Surface Water 0.1% AEP – Depth Axmi_07 - Surface Water 0.1% AEP – Hazard Axmi_07 - Surface Water 0.1% AEP - Velocity **Data analysis:** **3.3% AEP (1 in 30 year) event:** Proportion - 10% Max Depth – 3.63m; Mean Depth – 0.74m Max Velocity – 7.13m/s; Mean Velocity – 0.66m/s Max Hazard – 3.66; Mean Hazard – 1.26 **1% AEP (1 in 100 year) event:** Proportion - 16% Max Depth – 3.65m; Mean Depth – 0.62m Max Velocity – 6.89m/s; Mean Velocity – 0.52m/s Max Hazard – 3.62; Mean Hazard – 1.19 **0.1% AEP (1 in 1000 year) event:** Proportion - 31% Max Depth – 3.79m; Mean Depth – 0.63m Max Velocity – 3.48m/s; Mean Velocity – 0.45m/s Max Hazard – 3.66; Mean Hazard – 1.34 **Flood characteristics:** The site is shown to flood in all three events, with up to 31% coverage in the 0.1% AEP event. The flow path within the 3.3% AEP event flows from east to west along the culvert location, with localised flooding to the west, due to a slight depression within the topography. The flooding extent increases across the western portion of the site, with localised flooding to the north in the 0.1% AEP event. The mean depth and hazard in the 0.1% AEP event are 0.63m and 1.34 (a 'danger to most') respectively. The average velocity on site is shown to be 0.45m/s, with a maximum of 3.48m/s.
Surface water plus climate change	**Available data and mapping:** Environment Agency's Risk of Flooding from Surface Water dataset for the 3.33%, 1% and 0.1% AEP events with 65% Climate Change scenarios. Axmi_07 - Surface Water 3.33% AEP plus 65% Climate Change – Depth Axmi_07 - Surface Water 3.33% AEP plus 65% Climate Change – Hazard Axmi_07 - Surface Water 3.33% AEP plus 65% Climate Change - Velocity Axmi_07 - Surface Water 1% AEP plus 65% Climate Change – Depth Axmi_07 - Surface Water 1% AEP plus 65% Climate Change – Hazard Axmi_07 - Surface Water 1% AEP plus 65% Climate Change - Velocity Axmi_07 - Surface Water 0.1% AEP plus 65% Climate Change – Depth

East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Axmi_07**
Address	Axminster Carpets
	Axmi_07 - Surface Water 0.1% AEP plus 65% Climate Change – Hazard Axmi_07 - Surface Water 0.1% AEP plus 65% Climate Change - Velocity **Management Catchment:** Axmi_07 is located within the East Devon Management Catchment. The Environment Agency guidance recommends that the Upper End allowance is considered for both the 3.3% and 1% AEPs for the 2070's epoch, unless the allowance for the 2050's epoch is higher, in which case this should be used. This is appropriate for development with a lifetime beyond 2100. The recommended uplift on peak rainfall intensity for the 3.3% AEP is 40% and for the 1% AEP is 45%. As Risk of Flooding from Surface Water data with a 65% uplift was already available this has been used as the best available data for the 3.3%, 1% and 0.1% AEPs. **Data analysis:** **3.3% AEP (1 in 30 year) plus 65% climate change event:** Proportion - 24% Max Depth – 3.69m — Mean Depth – 0.57m Max Velocity – 2.67m/s — Mean Velocity – 0.37m/s Max Hazard – 3.19 — Mean Hazard – 1.19 **1% AEP (1 in 100 year) plus 65% climate change event:** Proportion - 30% Max Depth – 3.78m — Mean Depth – 0.62m Max Velocity – 2.69m/s — Mean Velocity – 0.4m/s Max Hazard – 3.53 — Mean Hazard – 1.32 **0.1% AEP (1 in 1000 year) plus 65% climate change event:** Proportion - 50% Max Depth – 3.99m — Mean Depth – 0.7m Max Velocity – 4.53m/s — Mean Velocity – 0.5m/s Max Hazard – 7.71 — Mean Hazard – 1.52 **Flood characteristics:** The site is shown to flood across the south and west of the site within all three events, with increasing extent to the east and north of the site within the 0.1% AEP plus climate change event. With the 0.1% AEP plus climate change event 50% of the site is shown to flood with an average depth of 0.7m. The mean velocity is shown to be 0.5m/s, with a maximum of 4.53m/s. The average hazard rating is 1.52, classed as a 'danger to most'.
Reservoir	The site is not located near to a Wet or Dry day reservoir flooding extent, according to the Environment Agency's reservoir flood mapping.
Groundwater	**Available data and mapping:** The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid. Axmi_07 - Groundwater Emergence **Flood characteristics:** During a 1% AEP groundwater flood event, groundwater levels are predominantly shown to be 'low risk', however levels are shown to be at or very near (within 0.025m of) the ground surface along the culvert's location across the site from east to west.

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Site Code	**Axmi_07**
Address	Axminster Carpets
	Flow paths would be expected to follow the topography of the site and be similar to surface water flow paths. The risk of groundwater flooding will require further consideration in a site-specific flood risk assessment.
Sewers	**Available data and mapping:** Devon County Councils Flood Incidents dataset **Flood characteristics:** In 2012 a sewerage event was recorded to the north of the site boundary due to surcharging toilets.
Flood history	**Available data and mapping:** Environment Agency's Recorded Flood Outlines extent. **Flood characteristics:** A small section along the western boundary of the site is shown to be located within the Environment Agency's Recorded Flood Outlines extent for the River Axe exceeding capacity in 1968. There are two flooding incidents within Devon County Council's dataset recorded within 100m of the site. On site a sewerage event was recorded detailed above, and to the east of the site an ordinary watercourse event was recorded in 2021 near the culvert resulting in flooding to gardens and a low level impact on a property internally.
Policy zones	
Critical drainage areas	The site has not been identified to be located within a critical drainage area. Axmi_07 - Critical Drainage Area
Coastal change management areas	The site has not been identified to be located within a coastal change management area.
Flood risk management infrastructure	
Existing defences	The Environment Agency's AIMS dataset shows there are no formal flood defences within the vicinity of the site.
Emergency planning	
Flood warning	A large portion of the site crossing from east to west has been identified to be located within an area of flood alerts for the River Axe area. The site is not shown to be located within a flood warning area. Axmi_07 - Flood Warnings and Alerts
Access and egress	Access and egress are shown to be affected during the 1% AEP plus climate change surface water modelling with flood depths up to 0.61m along Woodmead Road. Depths are however less than 0.21m within the 1% AEP plus climate change fluvial modelling at the same location along Woodmead Road. It is therefore recommended that access and egress is assessed within a site-specific assessment and a Flood Response Plan is developed.

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Site Code	**Axmi_07**
Address	Axminster Carpets

Requirements for drainage control and impact mitigation

Broad-scale assessment of possible SuDS

Geology and Soils

The geology consists of mudstone, siltstone and sandstone, with clay, silt and sand superficial deposits. The soils are shown to be freely draining slightly acid loamy soils. This suggests that infiltration may be a viable means of surface water disposal to the east of the site.

SuDS

- The site has not been identified to be located within a groundwater source protection zone, nitrate vulnerable zone or historic landfill site.
- Groundwater levels on site suggest low risk across the majority of the site, but levels close to the surface along the extent of the culvert. This suggests that infiltration may be limited in some areas. The infiltration potential of the site should be confirmed through infiltration testing, in line with BRE 365. Offsite discharge may therefore be required to discharge surface water runoff.
- Surface water discharge rates should not exceed pre-development discharge rates for the site and should be designed to be as close to greenfield runoff rates as reasonably practical in consultation 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.
- SuDS measures should follow the discharge hierarchy, and 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.
- Due to the topography, any surface water not intercepted via infiltration will drain via gravity to the west of the site and likely drain into the River Axe. It is therefore recommended that the LLFA and the EA are consulted about viable discharge locations for surface water from the site and their attenuation potential.

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 also provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.
- 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, and the critical drainage area requirements.
- 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 should be supported by an appropriately detailed maintenance and operation manual.

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	• SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements. • 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 their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will 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. • SuDS should be designed in line with Devon County Councils SuDS Guidance. https://www.devon.gov.uk/floodriskmanagement/document/sustainable-drainage-system-guidance-for-devon-2023/#dcc-documents-cpt-contents
NPPF and planning implications	
Exception Test requirements **(Local Authority considerations)**	The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied. The NPPF classifies the usage as "More Vulnerable"; this type is taken into consideration for the Exception Test. The site is partially located within Flood Zone 2 and 3, and the 0.1% AEP surface water and fluvial modelling extents. The Exception Test is therefore required for this site, with the potential for development in the north of the site. Detailed flood modelling should be assessed within a site-specific FRA.
Requirements and guidance for site-specific Flood Risk Assessment **(Developer considerations)**	**Flood Risk Assessment:** The Level 1 SFRA has more guidance on this section and any relevant policies and information applicable to development within East Devon District Council. • Consultation with the East Devon District Council, and where relevant South West Water, Devon County Council and the Environment Agency should be undertaken at an early stage. • Developers should consult with South West Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan. • Development plans should use the Level 1 and 2 SFRA for East Devon District Council, as well as the Local Flood Risk Management Strategies to identify cumulative flood risk issues. It should also promote an integrated approach to water management. • The site is located within a medium risk Cumulative Impact Assessment (CIA) catchment and therefore specific CIA policy documents are applicable to this site.

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	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 do not exceed greenfield rates. • Arrangements for safe access and egress are likely to be possible, however these will need to be considered further within a site-specific FRA for the surface water and fluvial events with an appropriate allowance for climate change, using the depth, velocity, and hazard outputs.

Key messages

The northern portion of the site is generally identified to be at low risk, and is not shown to be at risk of fluvial flooding within the detailed modelling, with small, localised surface water flooding. The site is shown to flood along the western and southern portions of the site and would be at high risk of flooding. Development would likely be inappropriate and more vulnerable development would not be permitted.

Development is likely to progress if:

- A site-specific FRA is undertaken to assess the risk of fluvial, surface water and groundwater flooding in relation to the proposed development, and the access and egress arrangements.
- Development is proposed within the northern portion of the site.
- Infiltration rates are assessed on site as part of a drainage strategy.
- Cumulative Impact Assessment policy documents must be understood, and the cumulative impact of development should be considered.

Redevelopment of this site could involve 'daylighting' the watercourse and revising ground levels to provide a dedicated green infrastructure corridor with the aim of providing certainty in terms of developing the remainder of the site. Parts of the site currently at risk of flooding could therefore be developed, whilst providing a development that would be safe in itself but that could also reduce overall flood risk.